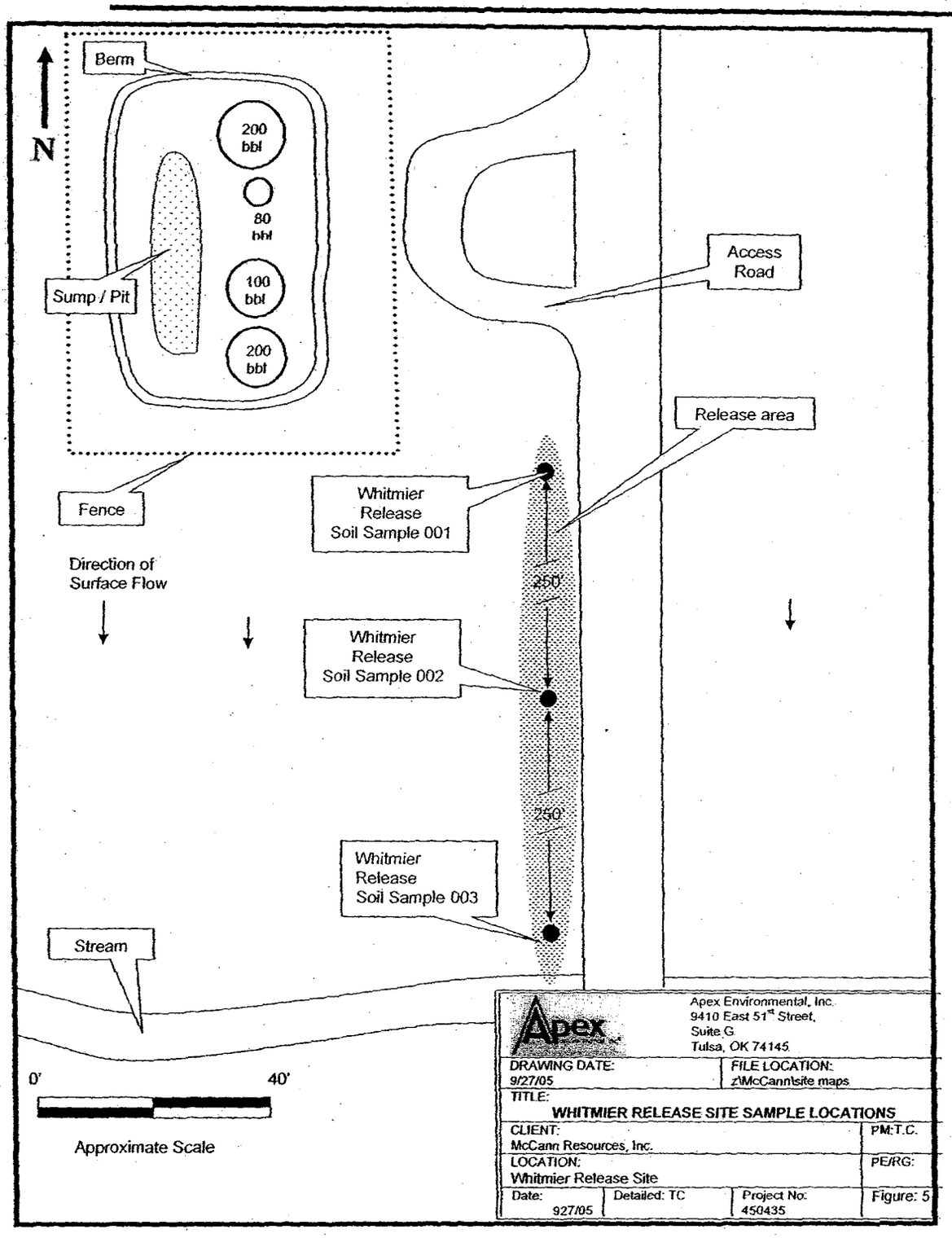

Berm
N
200 bbl
80 bbl
100 bbl
200 bbl
Sump / Pit
Access Road
Release area
Fence
Whitmier Release Soil Sample 001
Direction of Surface Flow
250'
Whitmier Release Soil Sample 002
250'
Whitmier Release Soil Sample 003
Stream
0'
40'
Approximate Scale
Apex Environmental, Inc.
9410 East 51st Street,
Suite G
Tulsa, OK 74145
DRAWING DATE: 9/27/05
FILE LOCATION: z:\McCann\site maps
TITLE: WHITMIER RELEASE SITE SAMPLE LOCATIONS
CLIENT: McCann Resources, Inc.
PM:T.C.
LOCATION: Whitmier Release Site
PE/RG:
Date: 927/05
Detailed: TC
Project No: 450435
Figure: 5

The analytical results indicate TSS in the samples ranged from 723 ppm in sample 001 (collected at the location nearest to the tank battery), to 812 ppm in sample 003 (collected farthest downgradient from the tank battery site). The TSS concentrations in samples collected at the Whitmier release site are within the normal range for a productive soil. Vegetation was abundant in the roadside ditch during the September 2005 site visit. A copy of the analytical laboratory report is included in **Attachment B**. A summary of the analytical results is included in the following table:

	Whitmier Historical Release Site		
Cations	Sample 001	Sample 002	Sample 003
Sodium (ppm)	70	74	42
Calcium (ppm)	87	88	104
Magnesium (ppm)	7	9	15
Potassium (ppm)	9	12	24
Derived Values			
Total Soluble Salts (TSS in ppm)	723	762	812
Sodium Adsorption Ratio (SAR)	1.9	2.0	1.0
Potassium Adsorption Ratio (PAR)	0.1	0.2	0.3
Exchangeable Sodium Percentage (ESP)	1.6	1.7	0.2
Exchangeable Potassium Percentage (EPP)	4.9	5.3	6.7
Other			
pH	8.2	8.2	8.2
EC (µmhos/cm)	1,095	1,155	1,230
Boron	0.03	0.1	0.03

CONCLUSION

No active leaks or obvious faulty equipment were observed during an inspection of lease equipment conducted on October 13, 2005.

Concentrations of TSS and other associated brine constituents were within normal ranges in surface soil samples collected from an historical release site on September 28, 2005.

With the combination of improvements needed (for SPCC purposes) and in the implementation of improved general housekeeping of the facility, a variety of basic steps are recommended.

This includes:

- Providing a means or method to improve spilled/released product recovery rates, efficiency, and effectiveness;
- Painting of the tanks;
- Removing rainwater from the collection sump,
- Implementing remediation of stained soil (including proper treatment and/or disposal procedures);
- Improving facility security with appropriate fencing; and,
- Regrading and improving the diking and the materials that they are composed of, as well as increasing potential containment volumes.

Multiple-Site Environmental Assessment Report

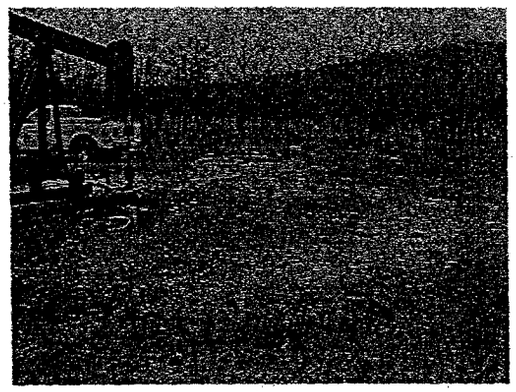
McCann Resources, Inc. — Parker Release Site #1

LOCATION SE ¼ 16-27-12

GENERAL ASSESSMENT A release occurred at the site approximately four (4) years ago. Estimated volume of released crude was 5 to 6 barrels. In conjunction, there was only a very small area of stressed vegetation present. No other oil staining or oil sheens were present.

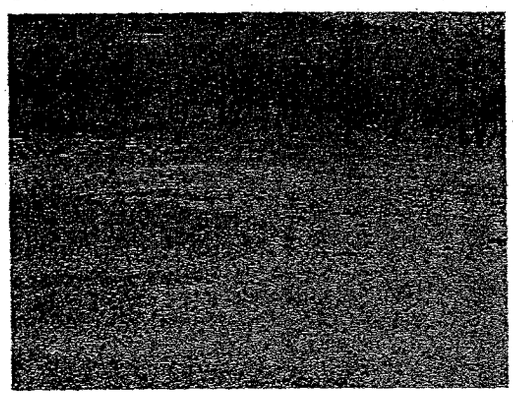
During the initial site visit on March 31, 2005, one (1) 3-point composite soil sample was collected and analyzed for total salinity. Soil sample locations and other site structures are illustrated in **Figure 6**.

DETAILS The following photos and photo-specific comments provide details regarding the facility's needed updates and compliance efforts:



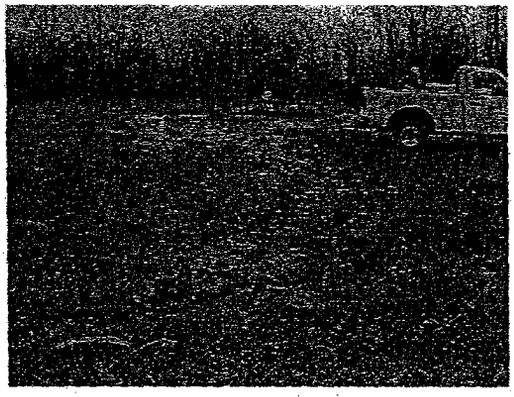
FINDINGS:
This shows the down slope area, where the 5 to 6 barrel release occurred.

SUGGESTIONS/SOLUTIONS:
Efforts to revitalize the stressed area were recommended in the May 6, 2005 version of this document. **McCann responded by removing/excavating the area of impacted soil in September 2005 and replacing it with new topsoil from a nearby source of clean soil. The area was reseeded and currently supporting new vegetative growth.**



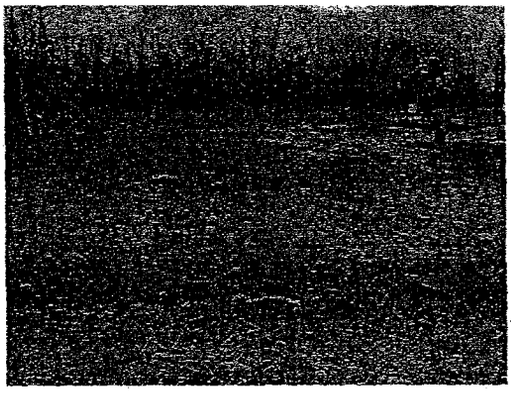
FINDINGS:
This photo shows the former area of stressed vegetation resulting from this release, from one angle (down-slope).

SUGGESTIONS/SOLUTIONS:
N/A.



FINDINGS:
This photo shows an alternate angle (up-slope) of the same area.

SUGGESTIONS/SOLUTIONS:
N/A.



FINDINGS:
This alternate angle shows evidence of standing water, down-slope of the release point. With no evidence of hydrocarbons (no staining or sheen) in the standing water.

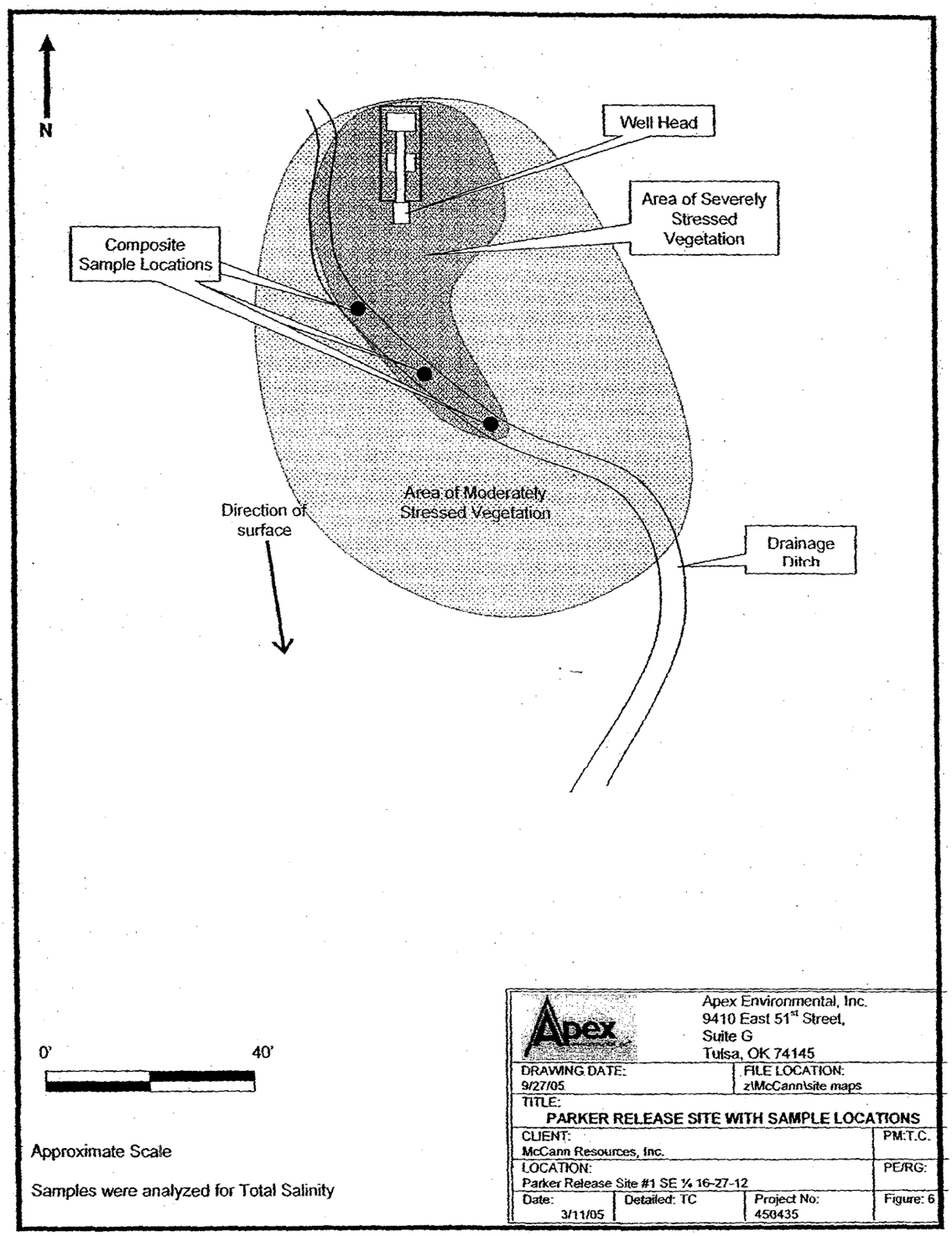
SUGGESTIONS/SOLUTIONS:
N/A

TEST RESULTS

The analytical results from the March 2005 sampling event indicate total soluble salts in the soil were 6,534 ppm, which is approximately two times higher than normal. Exchangeable sodium (1,795 ppm) is also higher than normal and may be responsible for poor water movement in the soil. A copy of the analytical laboratory report is included in Attachment B. The analytical results are summarized in the following table:

	Parker Release Site # 1 Sample
Cations	
Sodium (ppm)	1,795
Calcium (ppm)	55
Magnesium (ppm)	10
Potassium (ppm)	7
Derived Values	
Total Soluble Salts (TSS in ppm)	6,534
Sodium Adsorption Ratio (SAR)	58.5
Potassium Adsorption Ratio (PAR)	0.1
Exchangeable Sodium Percentage (ESP)	45.7
Exchangeable Potassium Percentage (EPP)	4.8
Other	
pH	7.5
EC (µmhos/cm)	9,900
Boron	0.48

CONCLUSION Elevated concentrations of total soluble salts were detected in surface soils at the release site. **Efforts to revitalize the stressed area were recommended in the May 6, 2005 version of this document. McCann responded by removing/excavating the area of impacted soil in September 2005 and replacing it with new topsoil from a nearby source of clean soil. The area was reseeded and is currently supporting new vegetative growth.**


N
Well Head
Area of Severely Stressed Vegetation
Composite Sample Locations
Area of Moderately Stressed Vegetation
Direction of surface
Drainage Ditch
0'
40'
Approximate Scale
Samples were analyzed for Total Salinity
Apex Environmental, Inc.
9410 East 51st Street,
Suite G
Tulsa, OK 74145
DRAWING DATE: 9/27/05
FILE LOCATION: z\McCann\site maps
TITLE: PARKER RELEASE SITE WITH SAMPLE LOCATIONS
CLIENT: McCann Resources, Inc.
PM:T.C.
LOCATION: Parker Release Site #1 SE ¼ 16-27-12
PE/RG:
Date: 3/11/05
Detailed: TC
Project No: 458435
Figure: 6

Multiple-Site Environmental Assessment Report

McCann Resources, Inc. — Parker Release Site #2

LOCATION SW ¼ 15-27-12

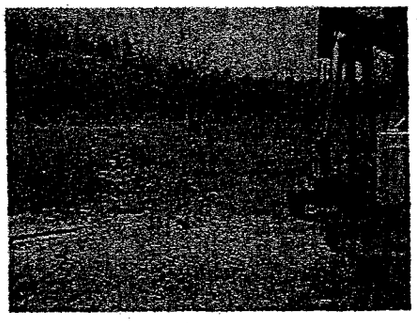
GENERAL ASSESSMENT A release of an unknown volume of crude oil occurred approximately 2 to 3 years ago, with a very small area of stressed vegetation present and minimal oil staining.

During the initial site visit on March 31, 2005, one (1) 3-point composite soil sample was collected and analyzed for total salinity. Soil sample locations and other site structures are illustrated in **Figure 7**.

DETAILS The following photos and photo-specific comments provide details regarding the facility's needed updates and compliance efforts:

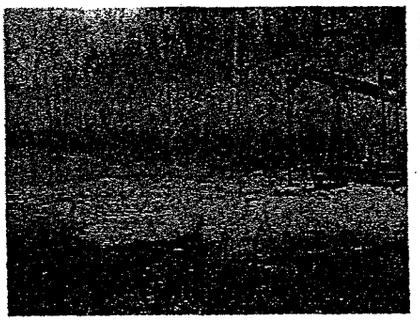
FINDINGS:
This view looks up-slope to the pump and release point, with stressed vegetation that has resulted in minor erosion.

SUGGESTIONS/SOLUTIONS:
Repair of the resulting erosion and revitalization of the stressed vegetation is recommended.



FINDINGS:
This alternate view of the pump and release point offers additional perspective of the release site.

SUGGESTIONS/SOLUTIONS:
N/A



FINDINGS:
Indications of staining (crude oil) from the pump were observed.

SUGGESTIONS/SOLUTIONS:
Steps to control/contain releases from the pump are recommended. **Efforts to revitalize the stressed area were recommended in the May 6, 2005 version of this document. McCann responded by removing/excavating the area of impacted soil in September 2005 and replacing it with new topsoil from a nearby source of clean soil. The area was reseeded and currently supporting new vegetative growth.**

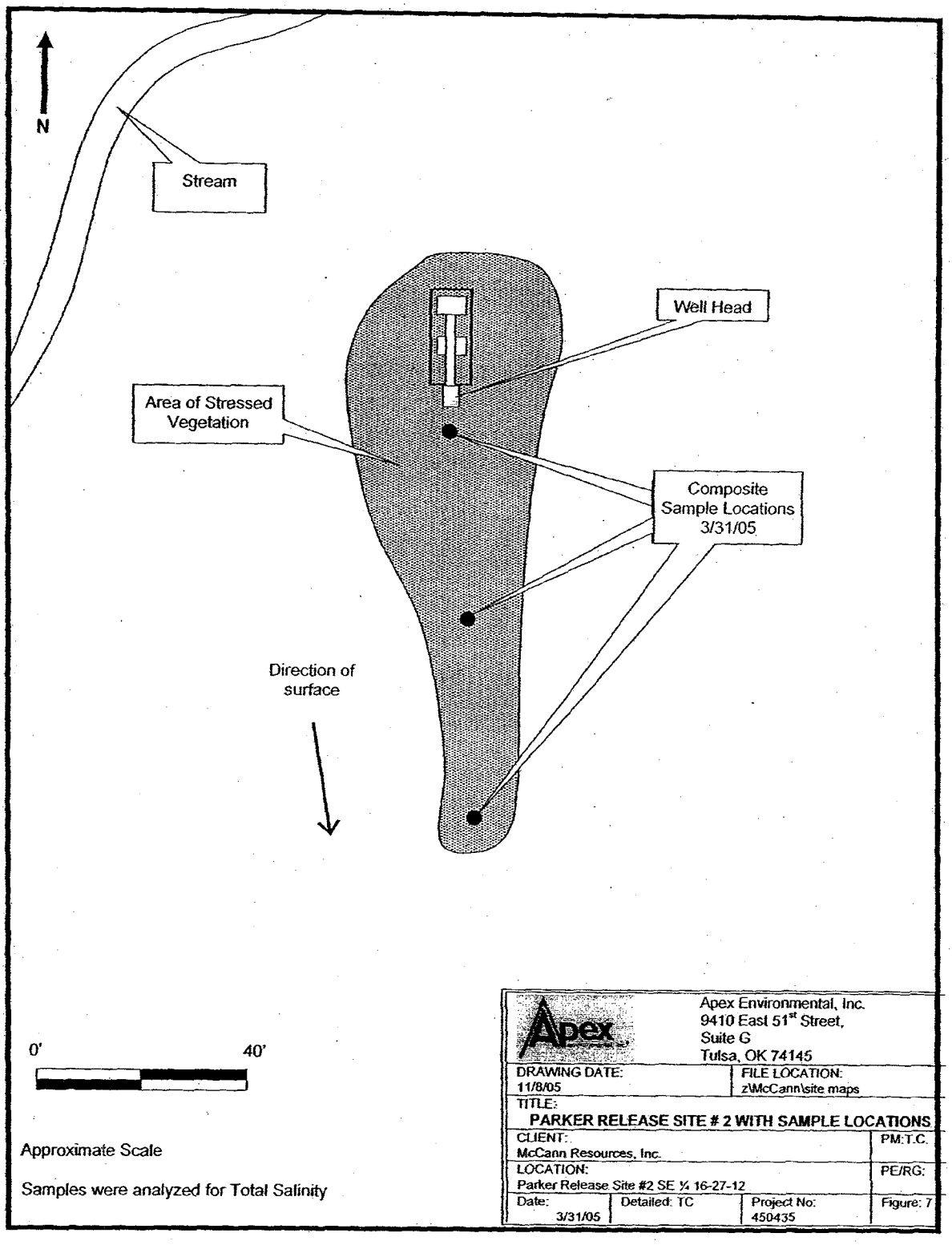
TEST RESULTS

The analytical results from the March 2005 sampling event indicate total soluble salts in the soil were 19,879 ppm, which is approximately eight times higher than normal. Exchangeable sodium (5,008 ppm) is also higher than normal and may be responsible for poor water movement in the soil. A copy of the analytical laboratory report is included in Attachment B. The analytical results are summarized in the following table:

Cations	Parker Release Site # 2 Sample
Sodium (ppm)	5,008
Calcium (ppm)	465
Magnesium (ppm)	98
Potassium (ppm)	28
Derived Values	
Total Soluble Salts (TSS in ppm)	19,879
Sodium Adsorption Ratio (SAR)	55.1
Potassium Adsorption Ratio (PAR)	0.2
Exchangeable Sodium Percentage (ESP)	44.2
Exchangeable Potassium Percentage (EPP)	5.2
Other	
pH	6.8
EC (µmhos/cm)	30,120
Boron	0.4

CONCLUSION

Elevated concentrations of total soluble salts were detected in surface soils at the release site in March 2005. **Efforts to revitalize the stressed area were recommended in the May 6, 2005 version of this document. McCann responded by removing/excavating the area of impacted soil in September 2005 and replacing it with new topsoil from a nearby source of clean soil. The area was reseeded and currently supporting new vegetative growth.**


N
Stream
Well Head
Area of Stressed Vegetation
Composite Sample Locations 3/31/05
Direction of surface
0'
40'
Approximate Scale
Samples were analyzed for Total Salinity
Apex Environmental, Inc.
9410 East 51st Street,
Suite G
Tulsa, OK 74145
DRAWING DATE: 11/8/05
FILE LOCATION: z\McCann\site maps
TITLE: PARKER RELEASE SITE # 2 WITH SAMPLE LOCATIONS
CLIENT: McCann Resources, Inc.
PM:T.C.
LOCATION: Parker Release Site #2 SE ¼ 16-27-12
PE/RG:
Date: 3/31/05
Detailed: TC
Project No: 450435
Figure: 7

Multiple-Site Environmental Assessment Report

McCann Resources, Inc. — Stream Release Point

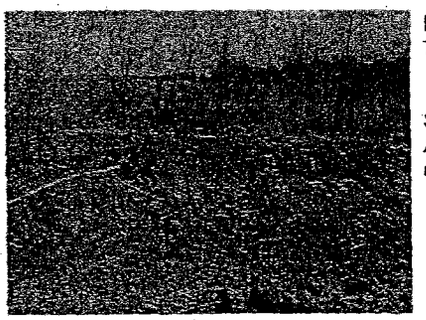
LOCATION Located on the Horton Lease

GENERAL ASSESSMENT Remediation (excavation) of petroleum-impacted soil was conducted at the site following the release event. Minor areas of residual stained soil were observed in the area. One 3-point composite soil sample was collected (SR-004).

DETAILS The following photos and photo-specific comments provide details regarding the facility's needed updates and compliance efforts:

FINDINGS:
Current piping across the stream is evident from this angle (potentially the previous release was from this area, via earlier piping that has since been replaced).

SUGGESTIONS/SOLUTIONS:
N/A

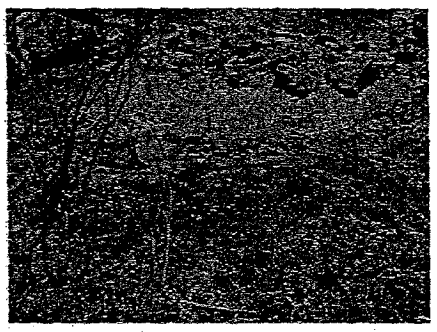


FINDINGS:
This shows the excavation area associated with the release.

SUGGESTIONS/SOLUTIONS:
Although, vegetation was not present during the March 2005 site visit, **new vegetation has been re-established at this time.**

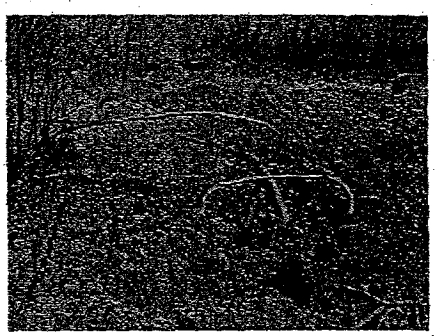
FINDINGS:
This is an alternate angle of the excavated area.

SUGGESTIONS/SOLUTIONS:
N/A



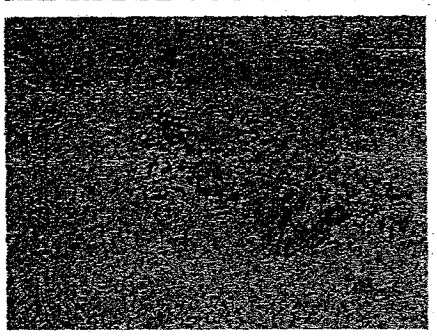
FINDINGS:
There was minor, residual oil staining on the shoreline.

SUGGESTIONS/SOLUTIONS:
Steps to reclaim, recycle, and/or remediate this stained soil is recommended.



FINDINGS:
This is an alternate angle of the excavated area.

SUGGESTIONS/SOLUTIONS:
N/A



FINDINGS:
Additional residual soil staining was identified near the excavation area.

SUGGESTIONS/SOLUTIONS:
Steps to reclaim, recycle, and/or remediate this stained soil is recommended.

TEST RESULTS

One composite soil sample collected from the excavation area was analyzed for benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8021B and fractional total petroleum hydrocarbons (TPH) by Texas method 1005. The analytical results indicate concentrations of total xylenes in the sample were 0.033 micrograms per kilogram (mg/Kg). Benzene, toluene, and ethylbenzene were not detected (below laboratory detection levels) in the sample.

Total petroleum hydrocarbons were detected at a concentration of 5,300 mg/Kg. Although, the site may not specifically be required to comply with OCC regulations, Apex compared the detected concentration to OCC Tier I guidance criteria as a means of determining relative significance of the detected TPH. This concentration of TPH exceeds OCC Tier I (most conservative) guidance standards of 5,000 mg/Kg. However, the site has not been formally ranked, and would not likely be classified as an OCC Tier I site. OCC guidance for Tier II sites is 10,000 mg/Kg TPH.

CONCLUSION

The April report included a recommendation to establish ground cover to minimize erosion. McCann reports that new vegetation has been re-established in the area.

Multiple-Site Environmental Assessment Report

McCann Resources, Inc. — Culver Injection Well #9

LOCATION NE ¼ 20-28-10

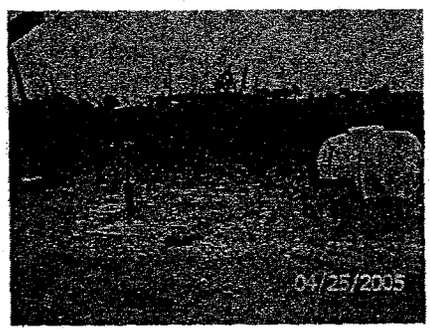
GENERAL ASSESSMENT Apex originally performed a photo assessment of the site in April 2004 using photos provided by McCann, as well as a site history, also provided by McCann. However, at the request of EPA Region VI, Apex visited the site on September 28, 2005 to collect surface soil samples to document site conditions. Additionally, equipment at the site was inspected on October 20, 2005 to assess the condition of existing piping/hoses and connections.

The Culver injection well #9 experienced a significant release of brine approximately three years ago. Following the release, McCann flushed the area with water and applied gypsum to the impacted soil. McCann also constructed an earthen berm on the down slope side of the structure to contain any future releases and retrofitted the equipment with brass fittings to resist corrosion caused by the brine fluids. A review of the photographs indicates the area immediately surrounding the well is lacking vegetation, which may be a result of the historic brine release or possibly associated with the operation and movement of equipment at an operating injection well.

DETAILS The following photos and photo-specific comments provide details regarding the facility's needed updates and compliance efforts:

FINDINGS:
Photos indicate a lack of ground vegetation around the injection well.

SUGGESTIONS/SOLUTIONS:
Considerations should be made, regarding a potential need for ground cover or re-vegetation.



FINDINGS:
Oxidized soils may be a result of the previous brine discharge.

SUGGESTIONS/SOLUTIONS:
Remedial efforts to flush residual brine from the surface soils and re-vegetate the area are recommended. Salts can be leached downward out of the surface soil, by natural rainfall events if the soil has good drainage. Leaching can be aided by the incorporation of organic matter tilled into the top six to eight inches of soil to provide added porosity and permeability to the soil structure.

FINDINGS:
This is an additional angle of the area.

SUGGESTIONS/SOLUTIONS:
N/A

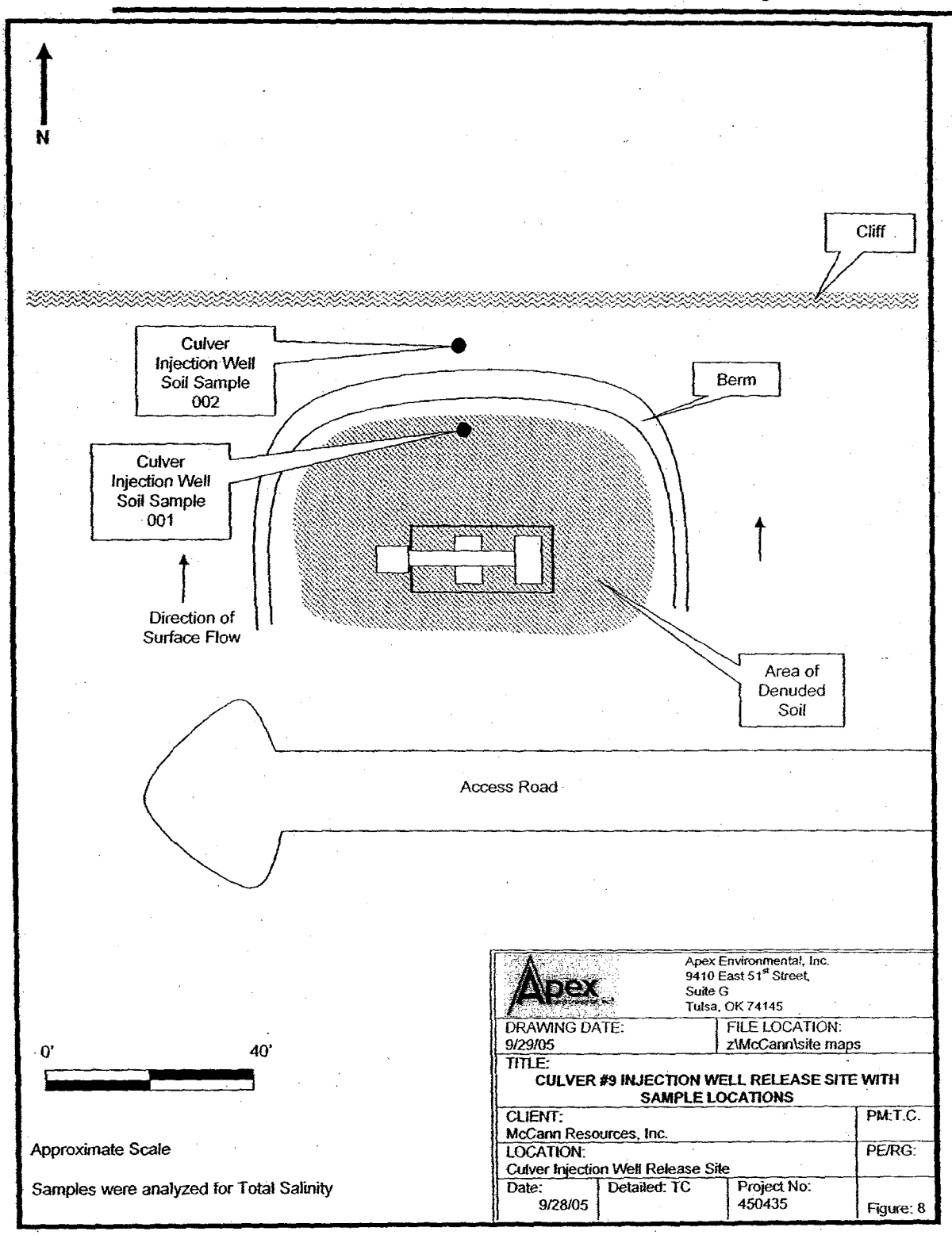
TEST RESULTS

The analytical results indicate total soluble salts (TSS) in the samples ranged from 10,256 ppm in sample 002 (collected down slope from the disposal well), to 97,614 ppm in sample 001 (collected immediately adjacent to the disposal well). The concentration of 10,256 ppm TSS is approximately four times higher than normal. The concentration of 97,614 ppm TSS in sample 001 is approximately 37 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops. A site sketch illustrating the approximate locations of the surface soil samples is included as **Figure 8**. A copy of the analytical laboratory report is included in **Attachment B**. A summary of the analytical results is included in the following table:

	Culver Injection Well # 9	
Cations	Sample 001	Sample 002
Sodium (ppm)	28,970	2,666
Calcium (ppm)	3,445	297
Magnesium (ppm)	597	33
Potassium (ppm)	191	14
Derived Values		
Total Soluble Salts (TSS in ppm)	97,614	10,256
Sodium Adsorption Ratio (SAR)	119.9	39.2
Potassium Adsorption Ratio (PAR)	0.5	0.1
Exchangeable Sodium Percentage (ESP)	63.4	35.9
Exchangeable Potassium Percentage (EPP)	7.8	4.6
Other		
pH	6.9	5.9
EC (µmhos/cm)	147,900	15,540
Boron	1.3	0.10

CONCLUSION

No leaks or obvious indications of faulty or damaged equipment were observed at the site during the equipment inspection on October 20, 2005. A summary of the inspection is included in the attached Mechanical Equipment Assessment Summary (**Attachment A**). The analytical results from surface soil samples collected at the site indicate significant impact from a historical brine spill at the site. Remedial actions to flush residual brine from the surface soils and re-vegetate the area are recommended. Salts can be leached downward out of the surface soil, by natural rainfall events if the soil has good drainage. Leaching can be aided by the incorporation of organic matter tilled into the top six to eight inches of soil to provide added porosity and permeability to the soil structure.


N
Cliff
Culver Injection Well Soil Sample 002
Berm
Culver Injection Well Soil Sample 001
Direction of Surface Flow
Area of Denuded Soil
Access Road
0'
40'
Approximate Scale
Samples were analyzed for Total Salinity
Apex Environmental, Inc.
9410 East 51st Street,
Suite G
Tulsa, OK 74145
DRAWING DATE: 9/29/05
FILE LOCATION: z\McCann\site maps
TITLE: CULVER #9 INJECTION WELL RELEASE SITE WITH SAMPLE LOCATIONS
CLIENT: McCann Resources, Inc.
PM:T.C.
LOCATION: Culver Injection Well Release Site
PE/RG:
Date: 9/28/05
Detailed: TC
Project No: 450435
Figure: 8

Multiple-Site Environmental Assessment Report

McCann Resources, Inc. Mullendore Ranch Salt Water Facility

LOCATION NW ¼ 21-29-11

GENERAL ASSESSMENT

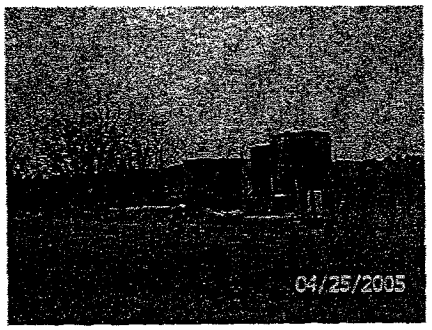
Apex initially performed a photo assessment of the site in April 2005 utilizing photos provided by McCann, as well as the following site history, also provided by McCann.

Mullendore Tank battery has three (3) 110 bbl salt water tanks surrounded by a similar berm as other tank batteries and a barbed wire fence. Mullendore experienced small release of salt water three and a half years ago. Brine was released to a small drainage ditch nearby. No evidence (stressed vegetation) of the release was present in these photos.

At the request of EPA Region VI, the site was revisited on September 28, 2005 to assess site conditions. Also, during that site visit, soil samples were collected at the historic brine release site on the east side of the facility. Three surface soil samples were collected for analysis of salt management parameters. Each sample consisted of a composite of three individual samples collected within a radius of approximately three feet at each sample location. A site sketch illustrating the approximate locations of the surface soil samples is included as **Figure 9**.

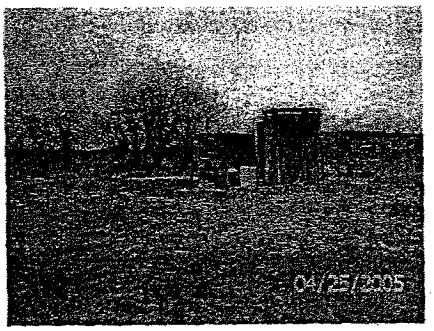
DETAILS

The following photos and photo-specific comments provide details regarding the facility's needed updates and compliance efforts:



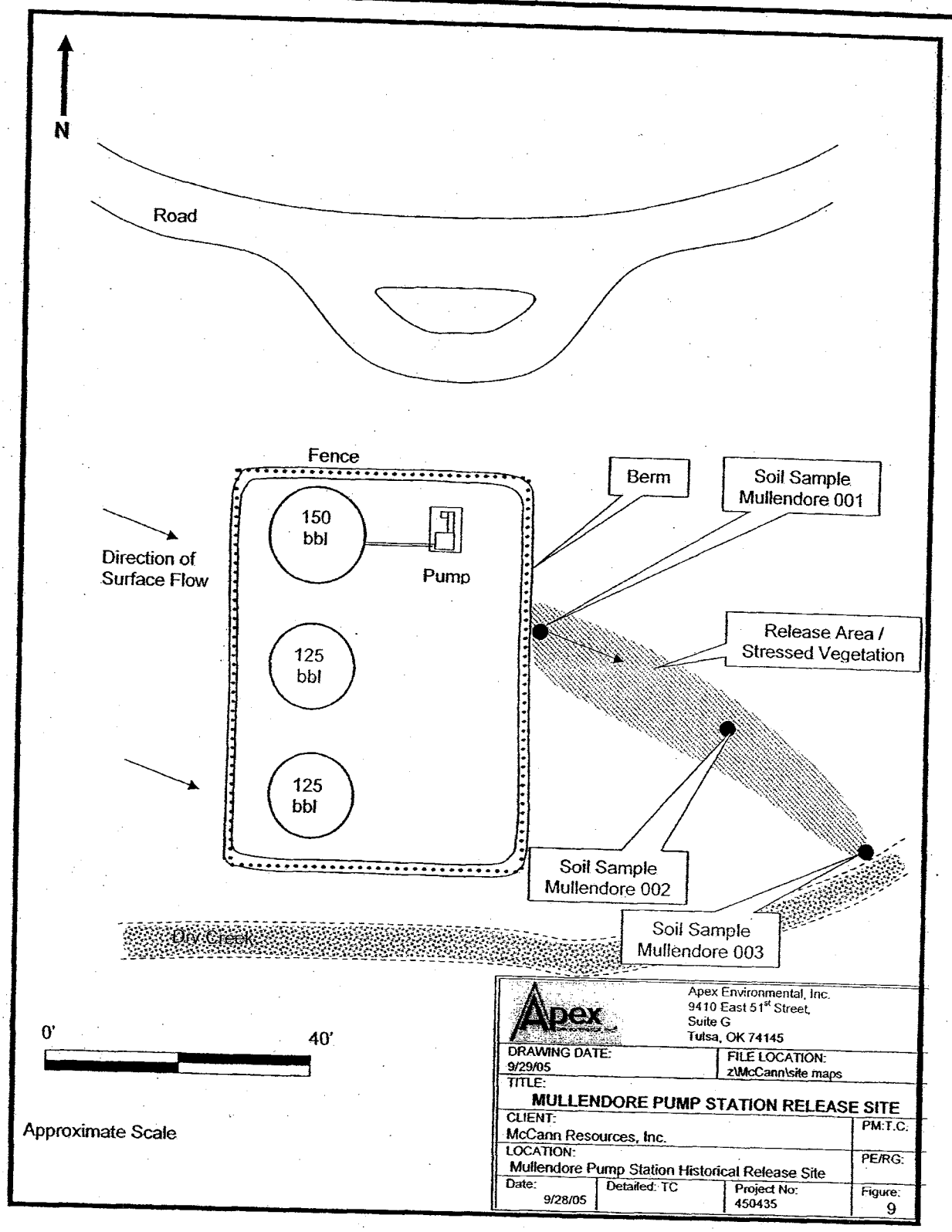
FINDINGS:
A lack of sufficient secondary containment (by SPCC regulations) around these tanks indicates that they are solely for salt water storage and that no hydrocarbons are stored.

SUGGESTIONS/SOLUTIONS:
If there are no hydrocarbons stored in these tanks (no sheen), then secondary containment does not appear to be necessary.



FINDINGS:
Minimal topography around the tanks is evident in this photo.

SUGGESTIONS/SOLUTIONS:
Because of the potential detriment that salt water could present for the surroundings, combined with the likelihood that impact to a high amount of surface area could result from a spill, improved secondary containment could prove to be a useful precautionary measure.


N
Road
Fence
150 bbl
Pump
125 bbl
125 bbl
Direction of Surface Flow
Berm
Soil Sample Mullendore 001
Release Area / Stressed Vegetation
Soil Sample Mullendore 002
Soil Sample Mullendore 003
Dry Creek
0'
40'
Approximate Scale
Apex Environmental, Inc.
9410 East 51st Street,
Suite G
Tulsa, OK 74145
DRAWING DATE: 9/29/05
FILE LOCATION: z\McCann\site maps
TITLE:
MULLENDORE PUMP STATION RELEASE SITE
CLIENT: McCann Resources, Inc.
PM:T.C.
LOCATION: Mullendore Pump Station Historical Release Site
PE/RG:
Date: 9/28/05
Detailed: TC
Project No: 450435
Figure: 9

TEST RESULTS

The analytical results of the soil samples indicated the TSS concentrations ranged from 32,076 ppm in sample 003 collected approximately 70 feet southeast of the site to 66,528 ppm in sample 001 collected near the facility tank berm. The TSS concentration at the 001 sample location is approximately 25 times higher than normal. A copy of the analytical laboratory report is included in Attachment B. The analytical results are summarized in the following table:

	Mullendore Ranch Release Site		
Cations	Sample 001	Sample 002	Sample 003
Sodium (ppm)	18,448	15,614	8,619
Calcium (ppm)	1,754	2,023	887
Magnesium (ppm)	332	376	138
Potassium (ppm)	167	114	53
Derived Values			
Total Soluble Salts (TSS in ppm)	66,528	58,806	32,076
Sodium Adsorption Ratio (SAR)	105.9	83.7	71.1
Potassium Adsorption Ratio (PAR)	0.6	0.4	0.3
Exchangeable Sodium Percentage (ESP)	60.5	54.7	50.7
Exchangeable Potassium Percentage (EPP)	8.7	6.9	5.9
Other			
pH	7.3	6.5	7.3
EC (µmhos/cm)	100,800	89,100	48,600
Boron	0.40	0.23	0.20

CONCLUSION

The only potential compliance issue associated with the facility is one of SPCC compliance. If there is a petroleum sheen evident in any of the storage vessels, then obtaining an SPCC plan should be considered.

Analytical results from surface soil samples indicated elevated salt concentrations at the location of the former brine release. Remedial actions to flush residual brine from the surface soils and re-vegetate the area are recommended. Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching can be aided by the incorporation of organic matter tilled into the top six to eight inches of soil.

LOCATION NW ¼ 21-28-11

GENERAL ASSESSMENT

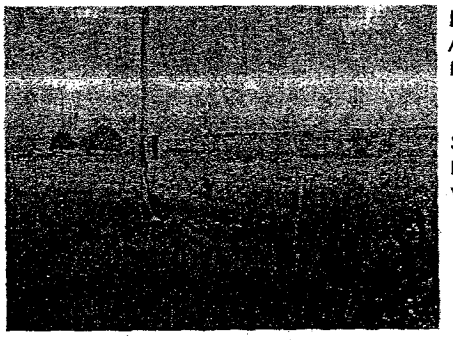
The Dixon-Rock Lease site is currently not in operation and has been combined with the Bowring Lease. The Dixon-Rock Lease has one remaining pumping well that has been re-piped to direct product to the Bowring tank battery. Tanks at the Dixon-Rock Tank Battery are currently empty and have been disconnected. Three wellheads on the Dixon-Rock lease were inspected on October 13, 2005 to assess any leaks or potential leaks associated with flow lines, connections, saltwater pumps, and associated equipment. The condition of the equipment appeared to be within industry standards in the area. No active leaks or obvious indications of faulty equipment were observed. A summary of the equipment inspections is included in the attached Mechanical Equipment Assessment Summary (**Attachment A**).

Apex visited the tank battery site on September 28, 2005 to assess site conditions and collect surface soil samples at the historic brine release site. An area of stressed vegetation and denuded soil, located at the tank battery site, is associated with an historical brine release that occurred site prior to McCann obtaining the lease. Although, McCann experienced a small brine release approximately three to four years ago and approximately two barrels of brine seeped through the berm at that time.

Three surface soil samples were collected for analysis of salt management parameters. Each sample consisted of a composite of three individual samples collected within a radius of approximately three feet at each sample location. A site sketch illustrating the approximate locations of the surface soil samples is included as **Figure 10**.

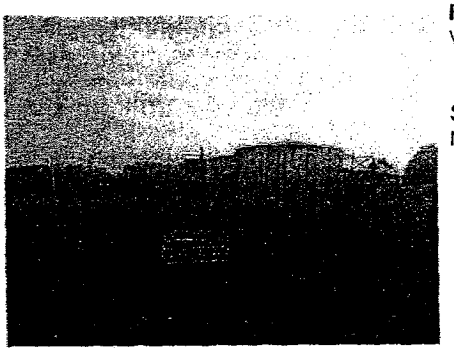
DETAILS

The following photos and photo-specific comments provide details regarding environmental concerns at the site:



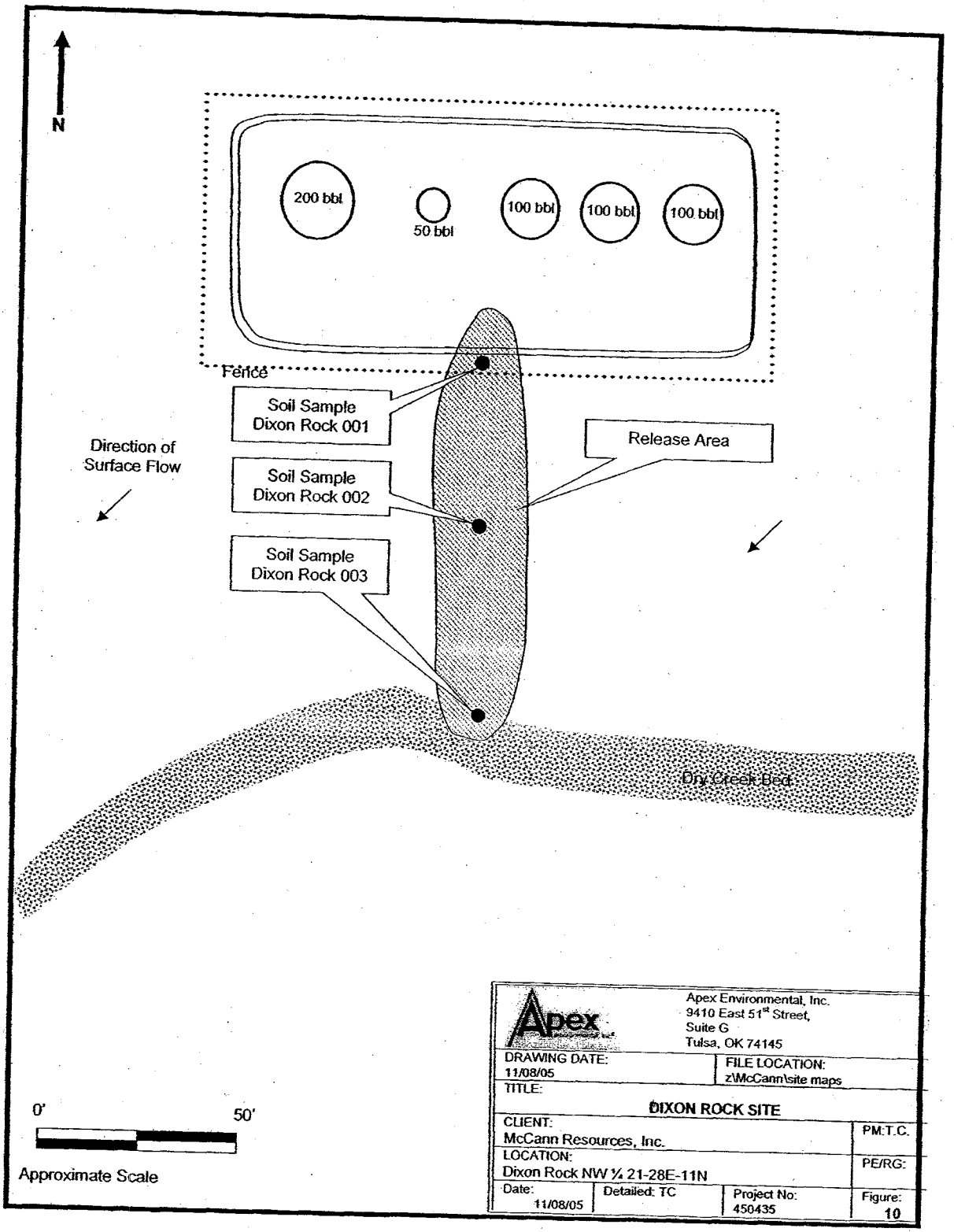
FINDINGS:
A small area of stressed vegetation and denuded soil, downslope from the former tank battery site, demarks the McCann spill site.

SUGGESTIONS/SOLUTIONS:
Remedial efforts to flush residual brine from the surface soils and re-vegetate the area are recommended.



FINDINGS:
Vegetation is abundant around most of the former tank battery site.

SUGGESTIONS/SOLUTIONS:
N/A.


N
200 bbl
50 bbl
100 bbl
100 bbl
100 bbl
Fence
Soil Sample
Dixon Rock 001
Soil Sample
Dixon Rock 002
Soil Sample
Dixon Rock 003
Release Area
Direction of
Surface Flow
Dry Creek Bed
0'
50'
Approximate Scale
Apex Environmental, Inc.
9410 East 51st Street,
Suite G
Tulsa, OK 74145
DRAWING DATE: 11/08/05
FILE LOCATION: z\McCann\site maps
TITLE: DIXON ROCK SITE
CLIENT: McCann Resources, Inc.
PM:T.C.
LOCATION: Dixon Rock NW ¼ 21-28E-11N
PE/RG:
Date: 11/08/05
Detailed: TC
Project No: 450435
Figure: 10

TEST RESULTS

The analytical results of the soil samples indicated the TSS concentrations ranged from 1,083 ppm in sample 003 collected approximately 70 feet south of the former bermed area to 23,899 ppm in sample 001 collected near the former facility tank berm. The TSS concentration at the 001 sample location is approximately 25 times higher than normal. A copy of the analytical laboratory report is included in Attachment B. The analytical results are summarized in the following table:

	Dixon-Rock Release Site		
Cations	Sample 001	Sample 002	Sample 003
Sodium (ppm)	5,912	453	185
Calcium (ppm)	1,100	110	80
Magnesium (ppm)	161	25	14
Potassium (ppm)	54	6	8
Derived Values			
Total Soluble Salts (TSS in ppm)	23,899	2,129	1,083
Sodium Adsorption Ratio (SAR)	44.0	10.1	5.0
Potassium Adsorption Ratio (PAR)	0.2	0.1	0.1
Exchangeable Sodium Percentage (ESP)	38.7	12.0	5.8
Exchangeable Potassium Percentage (EPP)	5.7	4.2	4.7
Other			
pH	6.8	7.1	7.7
EC (µmhos/cm)	36,210	3,225	1,641
Boron	0.12	0.06	0.06

CONCLUSION

The Dixon-Rock tank battery site is no longer in use. McCann reports the tanks have been emptied and disconnected; therefore, there is no potential for a spill or release.

Analytical results from surface soil samples indicated TSS concentrations ranged from 1,083 ppm in sample 003 to 23,899 ppm in sample 001. The elevated concentration in sample 001 is approximately nine times higher than normal; whereas, the concentration in samples 001 and 002 are within normal levels. Remedial actions to flush residual brine from the surface soils and re-vegetate the small area near the sample 001 location are recommended. Salts can be leached downward out of the surface soil by natural rainfall events, if the soil has good drainage. Leaching can be aided by the incorporation of organic matter tilled into the top six to eight inches of soil to provide increased porosity and permeability to the soil structure.

LOCATION SW ¼ 16-29-11

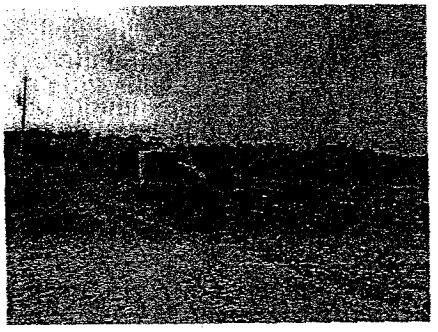
GENERAL ASSESSMENT

The Horton saltwater pump station is the location of an historical release as well as a recent release of oil and brine documented at the site in November 2004. The site is currently not in operation and tanks at the site are currently empty and have been disconnected. The saltwater pump has been moved to the Horton tank battery site and is positioned inside the bermed area. Apex visited the site on September 28, 2005 to assess site conditions and collect surface soil samples at the former release site. Impacted soil had previously been removed at the former release site and replaced with new topsoil from a nearby source and the area was reseeded. New vegetation had not yet germinated at the time of the site visit.

Three surface soil samples were collected for analysis of salt management parameters. Each sample consisted of a composite of three individual samples collected within a radius of approximately three feet at each sample location. A site sketch illustrating the approximate locations of the surface soil samples is included as **Figure 11**.

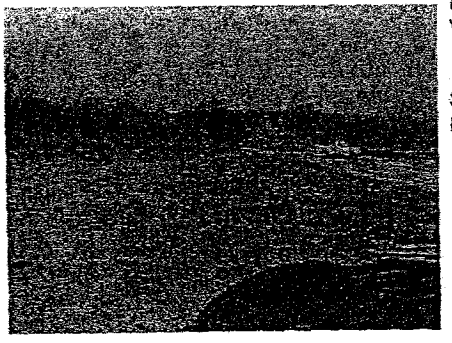
DETAILS

The following photos and photo-specific comments provide details regarding environmental concerns at the site:



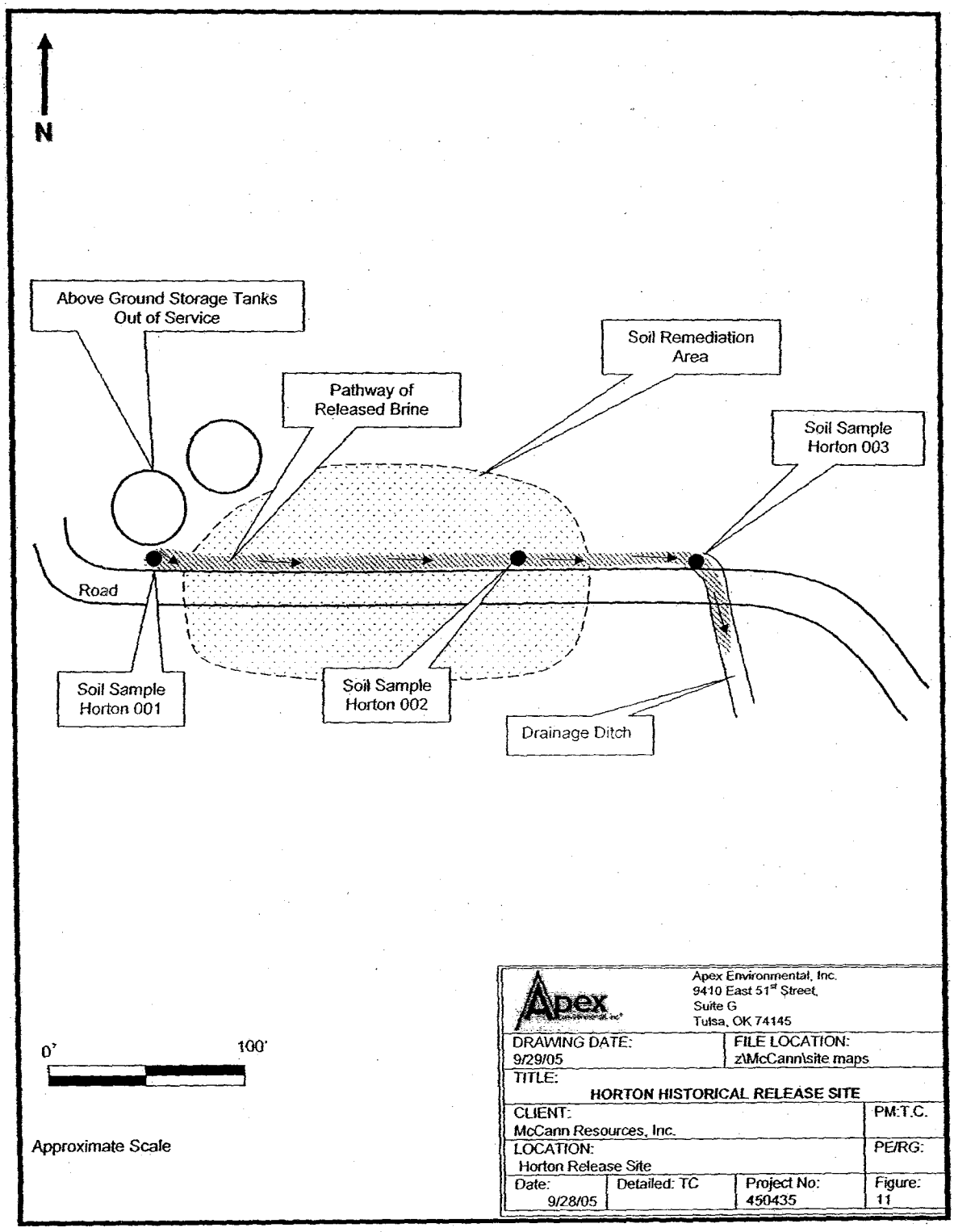
FINDINGS:
A large area of impacted soil has been removed east of the former tank battery and replaced with new topsoil from a nearby source. New vegetation has not yet germinated at the time of this photo on September 28, 2005. View looking west.

SUGGESTIONS/SOLUTIONS:
N/A



FINDINGS:
View of the remediation area looking east.

SUGGESTIONS/SOLUTIONS:
N/A.


N
Above Ground Storage Tanks Out of Service
Soil Remediation Area
Pathway of Released Brine
Soil Sample Horton 003
Road
Soil Sample Horton 001
Soil Sample Horton 002
Drainage Ditch
0'
100'
Approximate Scale
Apex Environmental, Inc.
9410 East 51st Street,
Suite G
Tulsa, OK 74145
DRAWING DATE: 9/29/05
FILE LOCATION: z\McCann\site maps
TITLE: HORTON HISTORICAL RELEASE SITE
CLIENT: McCann Resources, Inc.
PM:T.C.
LOCATION: Horton Release Site
PE/RG:
Date: 9/28/05
Detailed: TC
Project No: 450435
Figure: 11

TEST RESULTS

The analytical results of the soil samples indicated the TSS concentrations ranged from 1,303 ppm in sample 003 collected approximately 275 feet east of the former release area to 48,114 ppm in sample 001 collected at the former release site. The TSS concentration at the 001 sample location is approximately 18 times higher than normal. The TSS concentration at sample location 003 is within the normal range for a productive soil and the concentration at sample location 002 is only slightly above the normal range. A copy of the analytical laboratory report is included in Attachment B. The analytical results are summarized in the following table:

	Horton Release Site		
Cations	Sample 001	Sample 002	Sample 003
Sodium (ppm)	12,723	456	172
Calcium (ppm)	1,518	237	88
Magnesium (ppm)	287	33	35
Potassium (ppm)	95	14	57
Derived Values			
Total Soluble Salts (TSS in ppm)	48,114	3,109	1,303
Sodium Adsorption Ratio (SAR)	78.5	7.4	3.9
Potassium Adsorption Ratio (PAR)	0.3	0.1	0.8
Exchangeable Sodium Percentage (ESP)	53.1	8.7	4.3
Exchangeable Potassium Percentage (EPP)	6.7	4.8	10.4
Other			
pH	7.6	7.2	8.0
EC (µmhos/cm)	72,900	4,710	1,974
Boron	0.40	0.05	0.06

CONCLUSION

The Horton tank battery site is no longer in use. The tanks have been emptied and disconnected; therefore, there is no potential for a spill or release.

Analytical results from surface soil samples indicate an area of residual brine impacted soil is located immediately adjacent to the release site. The area immediately adjacent to the release site was likely not completely excavated to avoid potential damage to the storage tanks by excavation equipment. This small area of brine-impacted soil may require remediation to enhance natural leaching of salts from the soil. If vegetation does not recover in this area, leaching can be aided by the incorporation of organic matter tilled into the top six to eight inches of soil to provide increased porosity and permeability to the soil structure.

FORMAT

The following summary utilizes the assessments from each of the previous facilities and locations, to report on pertinent issues identified in correspondence and communications with the EPA. The structure of this summary also follows the order of topics/issues in the EPA's letter.

BRINE DISCHARGE FINDINGS

I. PART ONE

A. The initial assessment of all leases, for determining if any salt water is currently being discharged or spilled into the environment was previously implemented by the owner. Apex's site assessments showed no ongoing releases that were salt water-specific.

B. Apex assessed the degree of surface soil contamination, using visual inspections and (where appropriate) soil sampling at the following sites:

1. Bowring Tank Battery Release – Listed with Bowring Facility
2. Culver Tank Battery – Listed with Culver Facility
3. Culver Well No. 13 – Listed as Culver Well # 13
4. Thunderbolt and North Hickory Release Site
5. Whitmier Flow Line Release Site
6. Parker Well O-58 – Listed as Release #1
7. Parker Well O-69 – Listed as Release #2
8. Horton Stream Release Site
9. Culver Injection Well No. 9 – Listed as Culver Injection Well # 9
10. Mullendore Ranch Salt Water Facility
11. Dixon-Rock Tank Battery – Discontinued Site
12. Horton Release Site

II. PART TWO

A. Due to the fact that so many of the associated brine releases were more than two (2) years old, the development of a sampling plan (for obtaining appropriate soil and water samples) was replaced with a soil sampling effort, during the site visits, based on visual confirmation of stressed vegetation and areas identified by the EPA.

B. All samples were submitted to a credible lab for analysis.

III. PART THREE

The McCann lease sites were inspected in March 2005 with respect to SPCC compliance issues. Oil production equipment on six lease sites was inspected in October 2005 to assess any leaks or potential leaks associated with flow lines, connections, well heads, and associated equipment. Two McCann lease sites were not inspected:

1. **Hulah Lease** – Discontinued, Dismantled, and Removed Site
2. **Megana Lease** – Discontinued Site

The remaining sites showed a consistency in issues of concern that can be rectified through four general actions or changes in operating procedures, by McCann. Those four actions include:

1. **Security** – While some of the facilities have some form of fencing, a consistent and acceptable fencing at all facilities is recommended.
2. **Diking/Containment** – While certain pits/sumps that were observed are lined with bentonite, some of the berms, and the floors of the bermed areas may not have a sufficiently impermeable layer.
3. **Painting** – Apex recommended painting of tanks and equipment following the initial site inspection in March 2005. McCann responded to the recommendation by painting storage vessels at many of the lease sites in July 2005.
4. **Housekeeping** – Within the oil and gas industry, there are potentials for minor leaks, drips, or spills. Often these releases are not sufficiently reportable. However, if general policies for a facility's housekeeping are not sufficient, then the failure to clean up these minor events can result in cumulative conditions that are both substantial and have significant potential costs. Improved housekeeping policies, like immediate absorption of minor spills (when

discovered) or using catch pans (under a valve or potential leak point) can virtually eliminate the issue of minor leaks with minimal effort and cost.

5. **Equipment Maintenance** – Minor leaks were observed at some lease locations and recommendations to repair or replace faulty equipment were made while in the field. Repainting of storage vessels, conducted in July 2005, is included as preventative maintenance. Additional maintenance such as replacing seals and valves, burying plastic piping, and plugging valves are recommended maintenance items.

SPCC COMPLIANCE

Due to the changes in SPCC regulations, and the associated requirements for recertification under these new regulations, the SPCC plans for all storage facilities should be revised and submitted for new certification.

Also, because of the relative locations of these facilities, to each other, Apex recommends that a single SPCC plan be drafted to place all facilities under that plan. This process will not only ensure that none of the new compliance requirements are missed, but it will also unify the SPCC compliance actions taken at each facility.

ASSESSMENT CONCLUSION

There are two primary concerns and one secondary concern that should be noted, based on this assessment. The primary concerns are the status of each applicable facility's SPCC plan and the general housekeeping measures used at the various locations. The secondary concern is addressing the issue of brine water and the potential impact that it can have on the salinity in the soil, around the McCann facilities.

Both of the primary concerns will be addressed, when the SPCC plans are updated. The incorporation of SPCC policies and the associated training will not only meet certain deficiencies that could be associated with 40 CFR 112 (SPCC), but will also improve the general housekeeping policies across the system, both for those facilities that require SPCC plans and for those that do not.

Apex believes that the issue of brine water and potentially high salinity levels can be addressed with a two-fold approach, which includes:

- First, for those situations where the salinity levels may already be high, proactive measures are recommended. In each of the cases (in this report) where this was observed, specific types of proactive measures are offered for consideration.
- Second, as a preventative step, McCann should consider taking actions to minimize salinity impact, if brine water spills or releases should occur in the future. One example of this includes installing berms in areas that do not require such containment (for SPCC reason), for the sole purpose of minimizing the potential impact of spilled brine water. Another example is creating a basic spill response plan for brine water spills. This option would help with the possibility of future incidents and ensure that there is minimal opportunity for brine water to affect soil salinity levels.

Observations recorded during the inspection of wellheads, flow lines, saltwater pumps and ancillary equipment indicated only minor leaks and spills primarily at wellheads. The overall condition of the production equipment was generally good and within the industry standard in the area.

McCann has taken steps to maintain equipment (painting), respond to spills, and comply with local regulatory bodies. Additional steps including routine maintenance and improved housekeeping practices and SPCC improvements are recommended for McCann to maintain environmental compliance.

Attachment A
MECHANICAL EQUIPMENT ASSESSMENT

ATTACHMENT A

McCann Mechanical Equipment Assessment

NOTES: NO=not in operation / IO=in operation / W=injection / O=oil well / SWD=salt water disposal TB=tank battery / TA=Temporary abandoned

DATE	SITE	COMMENT
Parker lease		
10/13/2005	Parker 0-64	NO / No current leaks.
10/13/2005	Parker W-8	NO / No current leaks.
10/13/2005	Parker O-68	NO / No current leaks.
10/13/2005	Parker W-87	NO / No current leaks. Was injection, set pumping unit, hole was temporarily open
10/13/2005	Parker W-86	NO / No current leaks.
10/13/2005	Parker 0-67	NO / No current leaks.
10/13/2005	Parker 0-63	NO / Packing gland slight salt water leak
10/13/2005	Parker W-75	NO / No current leaks.
10/13/2005	Parker 0-58	NO / No current leaks.
10/13/2005	Parker 0-59	NO / No current leaks. Rubber hose @ flow line burnt, needs replaced before operating
10/13/2005	Parker W-76	NO / No current leaks.
10/13/2005	Parker 0-60	IO / Flowing / No current leaks
10/13/2005	Parker SWD / TB	NO / No current leaks.
10/13/2005	Parker W-80	NO / No current leaks.
10/13/2005	Parker 0-62	NO / No current leaks.
10/13/2005	Parker W-74	NO / No current leaks.
10/13/2005	Parker 0-61	NO / Leaky steel piping @ wellhead needs replaced.
10/13/2005	Parker 0-87	IO / Flowing / Leaking @ packing gland
10/13/2005	Parker 0-74	NO / 1" ball valve leaking @ wellhead
10/13/2005	Parker 0-75	NO / wellhead stuffing box leaking saltwater
10/13/2005	Parker W-88	NO / 1" ball valve leaking saltwater @ wellhead
10/13/2005	Parker W-83	NO / No current leaks.
10/13/2005	Parker 0-65	NO / No current leaks.
10/13/2005	Parker W-79	NO / No current leaks.
10/13/2005	Parker 0-66	NO / Slight stuffing box leak
10/13/2005	Parker W-84	NO / No current leaks.
10/13/2005	Parker 0-70	NO / 1/4" needle valve leaking saltwater @ wellhead
10/13/2005	Parker W-85	NO / No current leaks.
10/13/2005	Parker 0-71	NO / No current leaks.
10/13/2005	Parker 0-72	NO / No current leaks.
10/13/2005	Parker W-2	NO / No current leaks. Bad hose @ wellhead

ATTACHMENT A

McCann Mechanical Equipment Assessment

NOTES: NO=not in operation / IO=In operation / W=injection / O=oil well / SWD=salt water disposal TB=tank battery / TA=Temporary abandoned

Whitmier lease		
10/13/2005	Whitmier SWD P-33	NO / No current leaks.
10/13/2005	Whitmier 9-B	NO / No current leaks.
10/13/2005	Whitmier W 1-E	NO / No current leaks.
10/13/2005	Whitmier W 12	NO / No current leaks.
10/13/2005	Whitmier 5-B	NO / No current leaks. **No picture**
Bowring lease		
10/13/2005	Bowring 7	IO / Minor fresh oil @ wellhead, recommend replacing packing and/or wellhead stuffing box.
10/13/2005	Bowring 5	IO / No current leaks.
10/13/2005	Bowring 2	IO / 1" gate valve leaking @ wellhead
10/13/2005	Bowring 13	NO / No current leaks.
10/13/2005	Bowring SWD pump	NO / No current leaks.
10/13/2005	Bowring 6	NO / No current leaks.
10/13/2005	Bowring 4	IO / No current leaks.
10/13/2005	Bowring 10	IO / No current leaks.
10/13/2005	Bowring 11	NO / No current leaks.
10/13/2005	Bowring 3	NO / No current leaks.
10/13/2005	Hula 8	IO / No current leaks.
10/13/2005	Hula 1-A	NO / No current leaks. **No picture**
10/13/2005	Bowring-DX-Rock 17	NO / No current leaks.
10/13/2005	Bowring-DX-Rock 3	NO / No current leaks.
10/13/2005	Bowring 17 Inj	NO / No current leaks.
10/13/2005	Bowring 1	NO / No current leaks.
10/13/2005	Bowring-DX-Rock 6	NO / No current leaks. **No picture**
10/13/2005	Hula 12	IO / Small leak @ stuffing box. **No picture**
Culver lease		
10/20/2005	Culver 3-B	IO / No current leaks
10/20/2005	Culver 4	NO / TA / No current leaks
10/20/2005	Culver 9 Inj.	IO / No current leaks
10/20/2005	Culver 15	NO / TA / No current leaks
10/20/2005	Culver 3	IO / Leak @ stuffing box
10/20/2005	Culver 5	NO / TA / No current leaks
10/20/2005	Culver 13 Inj.	IO / No current leaks / Working over. Old salt water leak @ this site
10/20/2005	Culver 8	IO / No current leaks
10/20/2005	Culver 12	NO / TA / No current leaks
10/20/2005	Culver 11	NO / TA / No current leaks

ATTACHMENT A

McCann Mechanical Equipment Assessment

NOTES: NO=not in operation / IO=In operation / W=injection / O=oil well / SWD=salt water disposal TB=tank battery / TA=Temporary abandoned

10/20/2005	Culver 7	IO / No current leaks
10/20/2005	Culver 2	NO / TA / No current leaks
10/20/2005	Culver 1	NO / TA / No current leaks
10/20/2005	Culver TB	IO / No current leaks
Horton lease		
10/20/2005	Horton C-3	IO / No current leaks
10/20/2005	Horton M-1 Inj	IO / No current leaks
10/20/2005	Horton 2	IO / No current leaks
10/20/2005	Horton TB	IO / No current leaks
10/20/2005	Horton TB Separator	NO / Disconnected
10/20/2005	Horton 8	IO / No current leaks
10/20/2005	Horton Tanks	NO / Disconnected
10/20/2005	Horton 14	NO / TA / No current leaks / putting back in service
10/20/2005	Horton 9 Inj	IO / No current leaks
10/20/2005	Horton 5	NO / TA / No current leaks
10/20/2005	Horton 11	IO / Leaking stuffing box
10/20/2005	Horton 1	NO / No current leaks.
10/20/2005	Horton 12	NO / TA / Leaking stuffing box
10/20/2005	Horton 13	IO / No current leaks
10/20/2005	Horton 13-B	NO / TA / No current leaks
10/20/2005	Horton 15	IO / No current leaks
10/20/2005	Horton 10	NO / TA / No current leaks
10/20/2005	Horton C-1	NO / TA / No current leaks

GENERAL ASSESSMENT

Wellheads, flow lines, connections, saltwater pumps, and associated equipment were inspected. With a few minor exceptions, the overall condition of equipment was within the industry standard in the area.

RECOMMENDATIONS

- Fix all existing leaks, by either tightening connections, replacing seals or replace the part.
- Burry all plastic piping and rubber hoses where possible.
- Fence off all equipment where the public or live stock can access.
- Plug all valves the have potential to create a spill, if accidentally opened.

Attachment B
ANALYTICAL LABORATORY REPORTS

SOIL, WATER & FORAGE ANALYTICAL LABORATORY

Division of Agricultural Sciences and Natural Resources • Oklahoma State University
Plant and Soil Sciences • 048 Agricultural Hall • Stillwater, OK 74078
Email: soils_lab@mail.pss.okstate.edu
Website: http://clay.agr.okstate.edu/extension/swfal/intro.htm

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name:

Location:

Lab ID No.: 372514
Customer Code: 1689
Sample No.: 1
Received: 3/17/2005
Report Date: 3/25/2005

TEST RESULTS

Cations	
Sodium (ppm)	4126
Calcium (ppm)	1003
Magnesium (ppm)	211
Potassium (ppm)	41

Other	
pH	6.5
EC (µmhos/cm)	28110
Boron	0.23
Texture	Fine

Derived Values	
Total Soluble Salts(TSS in ppm)	18553
Sodium Adsorption Ratio (SAR)	30.9
Potassium Adsorption Ratio (PAR)	0.2
Exchangeable Sodium Percentage (ESP)	30.6
Exchangeable Potassium Percentage (EPP)	5.2

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 7 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

Incorporation of 10 tons of gypsum into the surface one to two inches will aid in removal of sodium and speed water movement into the soil (apply no more than 5 tons at one time).

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

OKLAHOMA COOPERATIVE EXTENSION SERVICE

SOIL, WATER & FORAGE ANALYTICAL LABORATORY

Division of Agricultural Sciences and Natural Resources • Oklahoma State University
Plant and Soil Sciences • 048 Agricultural Hall • Stillwater, OK 74078
Email: soils_lab@mail.pss.okstate.edu
Website: http://clay.agr.okstate.edu/extensio/swfal/intro.htm

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name:

Location:

Lab ID No.:	372515
Customer Code:	1689
Sample No.:	2
Received:	3/17/2005
Report Date:	3/25/2005

TEST RESULTS

Cations

Sodium (ppm)	3260
Calcium (ppm)	316
Magnesium (ppm)	122
Potassium (ppm)	21

Other

pH	5.3
EC (µmhos/cm)	20520
Boron	0.11
Texture	Medium

Derived Values

Total Soluble Salts(TSS in ppm)	13543
Sodium Adsorption Ratio (SAR)	39.5
Potassium Adsorption Ratio (PAR)	0.1
Exchangeable Sodium Percentage (ESP)	36.1
Exchangeable Potassium Percentage (EPP)	4.9

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 5 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

Incorporation of 11 tons of gypsum into the surface one to two inches will aid in removal of sodium and speed water movement into the soil (apply no more than 5 tons at one time).

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

SOIL, WATER & FORAGE ANALYTICAL LABORATORY

Division of Agricultural Sciences and Natural Resources • Oklahoma State University
Plant and Soil Sciences • 048 Agricultural Hall • Stillwater, OK 74078
Email: soils_lab@mail.pss.okstate.edu
Website: http://clay.agr.okstate.edu/extensio/swfaf/intro.htm

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name:

Location:

Lab ID No.:	372517
Customer Code:	1689
Sample No.:	3
Received:	3/17/2005
Report Date:	3/25/2005

TEST RESULTS

Cations

Sodium (ppm)	261
Calcium (ppm)	14
Magnesium (ppm)	4
Potassium (ppm)	4

Other

pH	6.2
EC (µmhos/cm)	1539
Boron	0.05
Texture	Medium

Derived Values

Total Soluble Salts(TSS in ppm)	1016
Sodium Adsorption Ratio (SAR)	16.0
Potassium Adsorption Ratio (PAR)	0.1
Exchangeable Sodium Percentage (ESP)	18.2
Exchangeable Potassium Percentage (EPP)	4.9

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt found in this soil is within the normal range for a productive soil.

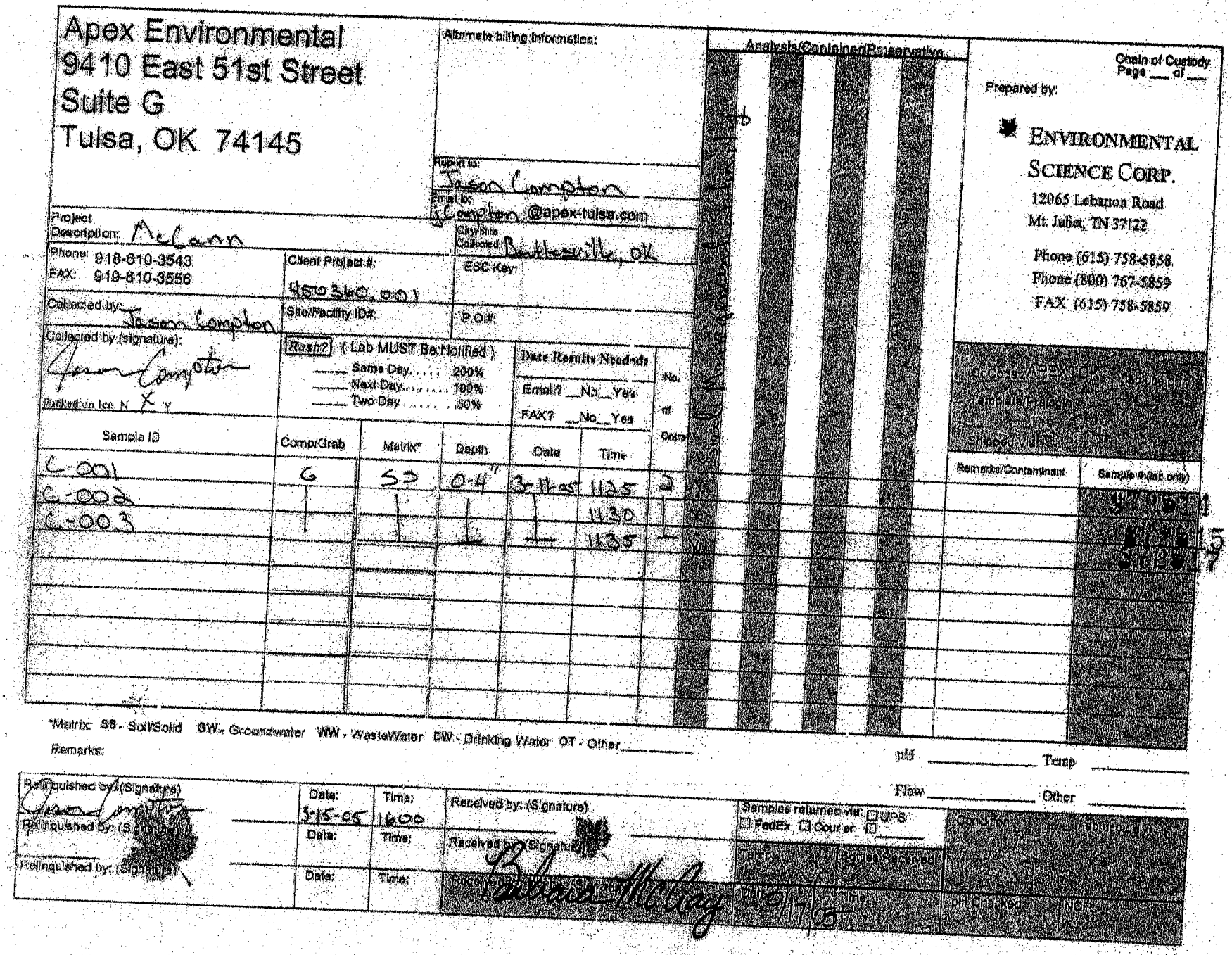
Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

Incorporation of 5 tons of gypsum into the surface one to two inches will aid in removal of sodium and speed water movement into the soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature



Apex Environmental
9410 East 51st Street
Suite G
Tulsa, OK 74145

Alternate billing information:

Report to: Jason Compton
Email to: Compton@apex-tulsa.com
Project Description: McCann
City/State Collected: Bartlesville, OK
Phone: 918-610-3543
FAX: 919-610-3556
Client Project #: 450360.001
ESC Key:
Collected by: Jason Compton
Site/Facility ID#:
P.O.#:
Collected by (signature):
Jason Compton
Packed on Ice N X Y

Rush? (Lab MUST Be Notified)
____ Same Day..... 200%
____ Next Day..... 100%
____ Two Day..... 50%

Date Results Needed:
Email? __No__Yes
FAX? __No__Yes

Analysis/Container/Preservative

Chain of Custody
Page ___ of ___

Prepared by:

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs								Remarks/Contaminant	Sample # (lab only)
C-001	G	SS	0-4"	3-11-05	1125	2	X								1
C-002					1130		X								5
C-003					1135		X								7

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Jason Compton	3-15-05	1600	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
			Rebecca Mabry
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____
Tracking #
Date: 3-17-05 Time:
Condition
pH Checked NCF

OKLAHOMA COOPERATIVE EXTENSION SERVICE

SOIL, WATER & FORAGE ANALYTICAL LABORATORY

APR 15 2005

Division of Agricultural Sciences and Natural Resources • Oklahoma State University
Department of Agronomy • 048 Agricultural Hall • Stillwater, OK 74078 • 405 744-6630 • Fax 405 744-5269

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name:

Location:

Lab ID No.: 374763
Customer Code: 1689
Sample No.: 1
Received: 4/5/2005
Report Date: 4/11/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	1795	Total Soluble Salts(TSS in ppm)	6534
Calcium (ppm)	55	Sodium Adsorption Ratio (SAR)	58.5
Magnesium (ppm)	10	Potassium Adsorption Ratio (PAR)	0.1
Potassium (ppm)	7	Exchangeable Sodium Percentage (ESP)	45.7
		Exchangeable Potassium Percentage (EPP)	4.8

Other	
pH	7.5
EC (µmhos/cm)	9900
Boron	0.48
Texture	Coarse

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 2 times higher than normal and sufficiently high to reduce yield of moderately tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

Incorporation of 9 tons of gypsum into the surface one to two inches will aid in removal of sodium and speed water movement into the soil (apply no more than 5 tons at one time).

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL **9410 EAST 51ST ST** **TULSA, OK 74145**	**Name:** **Location:**	**Lab ID No.:** 374764 **Customer Code:** 1689 **Sample No.:** 2 **Received:** 4/5/2005 **Report Date:** 4/11/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	5008	Total Soluble Salts(TSS in ppm)	19879
Calcium (ppm)	465	Sodium Adsorption Ratio (SAR)	55.1
Magnesium (ppm)	98	Potassium Adsorption Ratio (PAR)	0.2
Potassium (ppm)	28	Exchangeable Sodium Percentage (ESP)	44.2
		Exchangeable Potassium Percentage (EPP)	5.2

Other	
pH	6.8
EC (µmhos/cm)	30120
Boron	0.40
Texture	Coarse

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 8 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

Incorporation of 7 tons of gypsum into the surface one to two inches will aid in removal of sodium and speed water movement into the soil (apply no more than 5 tons at one time).

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

Chain of Custody

Page 1 of 1

Apex Environmental
9410 East 51st Street
Suite G
Tulsa, OK 74145

Alternate billing information:

Report to: Jason Compton

Email to: JCompton@apex-tulsa.com

Project Description: McCann

City/State Collected: Bartlesville, OK

Phone: 918-610-3543
FAX: 919-610-3556

Client Project #: 450360.001

ESC Key:

Collected by: Jason Compton

Site/Facility ID#:

P.O.#:

Collected by (signature): Jason Compton

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%

Date Results Needed:

Email? No Yes
FAX? No Yes

Packed on Ice: N Y

Analysis/Container/Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Remarks/Contaminant	Sample # (lab only)
PR-001	C	SS	0-4"	3-31-05	1215	2		
PR-002	C	SS	0-4"	3-31-05	1245	2		

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

pH _____ Temp _____

Remarks:

Flow _____ Other _____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Jason Compton	4-4-05	1100	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp _____ Condition

Date: 4/5/05 Time: 0900

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
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OKLAHOMA COOPERATIVE EXTENSION SERVICE

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Website: www.soiltesting.okstate.edu

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Bowring 001

Location:

Lab ID No.:	392788
Customer Code:	1689
Sample No.:	1
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	2509	Total Soluble Salts(TSS in ppm)	10791
Calcium (ppm)	367	Sodium Adsorption Ratio (SAR)	30.1
Magnesium (ppm)	84	Potassium Adsorption Ratio (PAR)	0.1
Potassium (ppm)	13	Exchangeable Sodium Percentage (ESP)	30.6
		Exchangeable Potassium Percentage (EPP)	4.4

Other	
pH	7.0
EC (pmhos/cm)	16350
Boron	0.07

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 4 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

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Website: www.soiltesting.okstate.edu

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Bowring 002
Location:

Lab ID No.:	392790
Customer Code:	1689
Sample No.:	2
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	562	Total Soluble Salts (TSS in ppm)	1899
Calcium (ppm)	22	Sodium Adsorption Ratio (SAR)	27.4
Magnesium (ppm)	6	Potassium Adsorption Rate (PAR)	0.1
Potassium (ppm)	4	Exchangeable Sodium Percentage (ESP)	28.0
		Exchangeable Potassium Percentage (EPP)	4.6

Other	
pH	8.3
EC (µmhos/cm)	2877
Boron	0.12

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt found in this soil is within the normal range for a productive soil.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Boring 003
Location:

Lab ID No.: 392791
Customer Code: 1689
Sample No.: 3
Received: 9/30/2005
Report Date: 10/6/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	519	Total Soluble Salts(TSS in ppm)	1198
Calcium (ppm)	43	Sodium Adsorption Ratio (SAR)	11.8
Magnesium (ppm)	7	Potassium Adsorption Ratio (PAR)	0.2
Potassium (ppm)	9	Exchangeable Sodium Percentage (ESP)	13.9
		Exchangeable Potassium Percentage (EPP)	5.4

Other	
pH	8.0
EC (umhos/cm)	1815
Boron	0.05

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt found in this soil is within the normal range for a productive soil.

Signature

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Website: www.soiltesting.okstate.edu

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: North Hickory 001

Location:

Lab ID No.:	392792
Customer Code:	1689
Sample No.:	11
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	10803	Total Soluble Salts (TSS in ppm)	45144
Calcium (ppm)	1653	Sodium Adsorption Ratio (SAR)	62.1
Magnesium (ppm)	390	Potassium Adsorption Ratio (PAR)	0.3
Potassium (ppm)	88	Exchangeable Sodium Percentage (ESP)	47.2
		Exchangeable Potassium Percentage (EPP)	6.3

Other	
pH	4.6
EC (umhos/cm)	68400
Boron	0.27

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 17 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

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Plant and Soil Sciences • 048 Agricultural Hall • Stillwater, OK 74078
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Website: www.soiltesting.okstate.edu

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: North Hickory 002
Location:

Lab ID No.:	392793
Customer Code:	1689
Sample No.:	12
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	22482	Total Soluble Salts(TSS in ppm)	82962
Calcium (ppm)	3276	Sodium Adsorption Ratio (SAR)	94.2
Magnesium (ppm)	635	Potassium Adsorption Ratio (PAR)	0.3
Potassium (ppm)	115	Exchangeable Sodium Percentage (ESP)	57.7
		Exchangeable Potassium Percentage (EPP)	6.2

Other	
pH	4.5
EC (µmhos/cm)	125700
Boron	0.44

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 31 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: North Hickory 003

Location:

Lab ID No.:	392794
Customer Code:	1689
Sample No.:	13
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations	
Sodium (ppm)	6991
Calcium (ppm)	685
Magnesium (ppm)	192
Potassium (ppm)	33

Other	
pH	4.7
EC (µmhos/cm)	40950
Boron	0.17

Derived Values	
Total Soluble Salts(TSS in ppm)	27027
Sodium Adsorption Ratio (SAR)	60.8
Potassium Adsorption Ratio (PAR)	0.2
Exchangeable Sodium Percentage (ESP)	46.7
Exchangeable Potassium Percentage (EPP)	5.1

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 10 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Mullendore 001

Location:

Lab ID No.:	392795
Customer Code:	1689
Sample No.:	21
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	18448	Total Soluble Salts(TSS in ppm)	66528
Calcium (ppm)	1754	Sodium Adsorption Ratio (SAR)	105.9
Magnesium (ppm)	332	Potassium Adsorption Ratio (PAR)	0.6
Potassium (ppm)	167	Exchangeable Sodium Percentage (ESP)	60.5
		Exchangeable Potassium Percentage (EPP)	8.7

Other	
pH	7.3
EC (µmhos/cm)	100800
Boron	0.40

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 25 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

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Website: www.soiltesting.okstate.edu

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Mullendore 002

Location:

Lab ID No.:	392796
Customer Code:	1689
Sample No.:	22
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations

Sodium (ppm)	15614
Calcium (ppm)	2023
Magnesium (ppm)	376
Potassium (ppm)	114

Other

pH	6.5
EC (µmhos/cm)	89100
Boron	0.23

Derived Values

Total Soluble Salts(TSS in ppm)	58806
Sodium Adsorption Ratio (SAR)	83.7
Potassium Adsorption Ratio (PAR)	0.4
Exchangeable Sodium Percentage (ESP)	54.7
Exchangeable Potassium Percentage (EPP)	6.9

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 22 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

OKLAHOMA COOPERATIVE EXTENSION SERVICE

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Plant and Soil Sciences - 048 Agricultural Hall - Stillwater, OK 74078
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Website: www.soiltesting.okstate.edu

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Mullendore 003

Location:

Lab ID No.:	392797
Customer Code:	1689
Sample No.:	23
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations

Sodium (ppm)	8619
Calcium (ppm)	887
Magnesium (ppm)	138
Potassium (ppm)	53

Other

pH	7.3
EC (µmhos/cm)	48600
Boron	0.20

Derived Values

Total Soluble Salts(TSS in ppm)	32076
Sodium Adsorption Ratio (SAR)	71.1
Potassium Adsorption Ratio (PAR)	0.3
Exchangeable Sodium Percentage (ESP)	50.7
Exchangeable Potassium Percentage (EPP)	5.9

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 12 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

OKLAHOMA COOPERATIVE EXTENSION SERVICE

SOIL, WATER & FORAGE ANALYTICAL LABORATORY
Division of Agricultural Sciences and Natural Resources • Oklahoma State University
Plant and Soil Sciences • 048 Agricultural Hall • Stillwater, OK 74078
Email: soils_lab@mail.pss.okstate.edu
Website: www.soiltesting.okstate.edu

SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9418 EAST 51ST ST

TULSA, OK 74145

Name: Horton 001

Location:

Lab ID No.: 392798
Customer Code: 1689
Sample No.: 31
Received: 9/30/2005
Report Date: 10/6/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	12723	Total Soluble Salts(TSS in ppm)	48114
Calcium (ppm)	1518	Sodium Adsorption Ratio (SAR)	78.5
Magnesium (ppm)	287	Potassium Adsorption Ratio (PAR)	0.3
Potassium (ppm)	95	Exchangeable Sodium Percentage (ESP)	53.1
		Exchangeable Potassium Percentage (EPP)	6.7

Other	
pH	7.6
EC (umhos/cm)	72900
Boron	0.40

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 18 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: ~~Horton~~ 002

Location:

Lab ID No.:	392800
Customer Code:	1689
Sample No.:	32
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations

Sodium (ppm)	456
Calcium (ppm)	237
Magnesium (ppm)	33
Potassium (ppm)	14

Other

pH	7.2
EC (µmhos/cm)	4710
Boron	0.05

Derived Values

Total Soluble Salts(TSS in ppm)	3109
Sodium Adsorption Ratio (SAR)	7.4
Potassium Adsorption Ratio (PAR)	0.1
Exchangeable Sodium Percentage (ESP)	8.7
Exchangeable Potassium Percentage (EPP)	4.8

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is slightly higher than normal and sufficiently high to reduce yield of moderately tolerant crops.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Horton 003

Location:

Lab ID No.:	392801
Customer Code:	1689
Sample No.:	33
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	172	Total Soluble Salts(TSS in ppm)	1303
Calcium (ppm)	88	Sodium Adsorption Ratio (SAR)	3.9
Magnesium (ppm)	35	Potassium Adsorption Ratio (PAR)	0.8
Potassium (ppm)	57	Exchangeable Sodium Percentage (ESP)	4.3
		Exchangeable Potassium Percentage (EPP)	10.4

Other

pH	8.0
EC (µmhos/cm)	1974
Boron	0.06

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*:

Total soluble salt found in this soil is within the normal range for a productive soil.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Dixon-Rock 001

Location:

Lab ID No.: 392802
Customer Code: 1689
Sample No.: 41
Received: 9/30/2005
Report Date: 10/6/2005

TEST RESULTS

Cations	
Sodium (ppm)	5912
Calcium (ppm)	1100
Magnesium (ppm)	161
Potassium (ppm)	54

Other	
pH	6.8
EC (µmhos/cm)	36210
Boron	0.12

Derived Values	
Total Soluble Salts(TSS in ppm)	23899
Sodium Adsorption Ratio (SAR)	44.0
Potassium Adsorption Ratio (PAR)	0.2
Exchangeable Sodium Percentage (ESP)	38.7
Exchangeable Potassium Percentage (EPP)	5.7

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 9 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Dixon-Rock 002

Location:

Lab ID No.:	392803
Customer Code:	1689
Sample No.:	42
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations

Sodium (ppm)	453
Calcium (ppm)	110
Magnesium (ppm)	25
Potassium (ppm)	6

Other

pH	7.1
EC (µmhos/cm)	3225
Boron	0.06

Derived Values

Total Soluble Salts(TSS in ppm)	2129
Sodium Adsorption Ratio (SAR)	10.1
Potassium Adsorption Ratio (PAR)	0.1
Exchangeable Sodium Percentage (ESP)	12.0
Exchangeable Potassium Percentage (EPP)	4.2

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt found in this soil is within the normal range for a productive soil.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Dixon Rock 003

Location:

Lab ID No.:	392804
Customer Code:	1689
Sample No.:	43
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations	
Sodium (ppm)	185
Calcium (ppm)	80
Magnesium (ppm)	14
Potassium (ppm)	8

Other	
pH	7.7
EC (umhos/cm)	1641
Boron	0.06

Derived Values	
Total Soluble Salts(TSS in ppm)	1083
Sodium Adsorption Ratio (SAR)	5.0
Potassium Adsorption Ratio (PAR)	0.1
Exchangeable Sodium Percentage (ESP)	5.8
Exchangeable Potassium Percentage (EPP)	4.7

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt found in this soil is within the normal range for a productive soil.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Whitmier 001

Location:

Lab ID No.: 392805
Customer Code: 1689
Sample No.: 51
Received: 9/30/2005
Report Date: 10/6/2005

TEST RESULTS

Cations	
Sodium (ppm)	70
Calcium (ppm)	87
Magnesium (ppm)	7
Potassium (ppm)	9

Other	
pH	8.2
EC (µmhos/cm)	1095
Boron	0.03

Derived Values	
Total Soluble Salts(TSS in ppm)	723
Sodium Adsorption Ratio (SAR)	1.9
Potassium Adsorption Ratio (PAR)	0.1
Exchangeable Sodium Percentage (ESP)	1.6
Exchangeable Potassium Percentage (EPP)	4.9

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt found in this soil is within the normal range for a productive soil.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Whitmier 002

Location:

Lab ID No.:	392806
Customer Code:	1689
Sample No.:	52
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations

Sodium (ppm)	74
Calcium (ppm)	88
Magnesium (ppm)	9
Potassium (ppm)	12

Other

pH	8.2
EC (umhos/cm)	1155
Boron	0.05

Derived Values

Total Soluble Salts(TSS in ppm)	762
Sodium Adsorption Ratio (SAR)	2.0
Potassium Adsorption Ratio (PAR)	0.2
Exchangeable Sodium Percentage (ESP)	1.7
Exchangeable Potassium Percentage (EPP)	5.3

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt found in this soil is within the normal range for a productive soil.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: whitmeir 003

Location:

Lab ID No.:	392807
Customer Code:	1689
Sample No.:	53
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations

Sodium (ppm)	42
Calcium (ppm)	104
Magnesium (ppm)	15
Potassium (ppm)	24

Other

pH	8.2
EC (µmhos/cm)	1230
Boron	0.03

Derived Values

Total Soluble Salts (TSS in ppm)	812
Sodium Adsorption Ratio (SAR)	1.0
Potassium Adsorption Ratio (PAR)	0.3
Exchangeable Sodium Percentage (ESP)	0.2
Exchangeable Potassium Percentage (EPP)	6.7

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt found in this soil is within the normal range for a productive soil.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Culver #9 001

Location:

Lab ID No.: 392808
Customer Code: 1689
Sample No.: 61
Received: 9/30/2005
Report Date: 10/6/2005

TEST RESULTS

Cations		Derived Values	
Sodium (ppm)	28970	Total Soluble Salts(TSS in ppm)	97614
Calcium (ppm)	3445	Sodium Adsorption Ratio (SAR)	119.9
Magnesium (ppm)	597	Potassium Adsorption Ratio (PAR)	0.5
Potassium (ppm)	191	Exchangeable Sodium Percentage (ESP)	63.4
		Exchangeable Potassium Percentage (EPP)	7.8

Other	
pH	6.9
EC (umhos/cm)	147900
Boron	1.34

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 37 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Culver #9 002

Location:

Lab ID No.: 392810
Customer Code: 1689
Sample No.: 62
Received: 9/30/2005
Report Date: 10/6/2005

TEST RESULTS

Cations	
Sodium (ppm)	2666
Calcium (ppm)	297
Magnesium (ppm)	33
Potassium (ppm)	14

Other	
pH	6.9
EC (µmhos/cm)	15540
Boron	0.10

Derived Values	
Total Soluble Salts(TSS in ppm)	10256
Sodium Adsorption Ratio (SAR)	39.2
Potassium Adsorption Ratio (PAR)	0.1
Exchangeable Sodium Percentage (ESP)	35.9
Exchangeable Potassium Percentage (EPP)	4.6

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 4 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Culver Tank Battery
Location: 001

Lab ID No.:	392811
Customer Code:	1699
Sample No.:	71
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations

Sodium (ppm)	4238
Calcium (ppm)	203
Magnesium (ppm)	32
Potassium (ppm)	22

Other

pH	7.9
EC (umhos/cm)	21600
Boron	0.48

Derived Values

Total Soluble Salts(TSS in ppm)	14256
Sodium Adsorption Ratio (SAR)	72.9
Potassium Adsorption Ratio (PAR)	0.2
Exchangeable Sodium Percentage (ESP)	51.3
Exchangeable Potassium Percentage (EPP)	5.6

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 5 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

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SOIL SALINITY REPORT

APEX ENVIRONMENTAL
9410 EAST 51ST ST

TULSA, OK 74145

Name: Culver Tank Battery
Location: 00 2

Lab ID No.:	392812
Customer Code:	1689
Sample No.:	72
Received:	9/30/2005
Report Date:	10/6/2005

TEST RESULTS

Cations

Sodium (ppm)	2174
Calcium (ppm)	245
Magnesium (ppm)	27
Potassium (ppm)	16

Other

pH	8.1
EC (umhos/cm)	12870
Boron	0.27

Derived Values

Total Soluble Salts(TSS in ppm)	8494
Sodium Adsorption Ratio (SAR)	35.2
Potassium Adsorption Ratio (PAR)	0.2
Exchangeable Sodium Percentage (ESP)	33.4
Exchangeable Potassium Percentage (EPP)	4.9

INTERPRETATION AND REQUIREMENTS FOR *Salinity Management (1:1 Soil to water extraction)*

Total soluble salt in this soil is about 3 times higher than normal and sufficiently high to reduce yield of even salt tolerant crops.

Exchangeable sodium is much higher than normal and may be responsible for poor water movement in soil.

Salts can be leached downward out of the surface soil, if the soil has good drainage. Leaching will be aided by incorporation of 20 to 30 tons of organic matter per acre in the top 6 inches of soil.

During the reclamation period avoid deep tillage such as moldboard plowing and establish a salt tolerant crop (barley, bermudagrass etc.) to provide ground cover for as much of the growing season as possible. If there is a white salty crust on the soil surface, delay planting the salt tolerant crop until the crust no longer forms during a soil drying cycle. Planting while the salty crust remains will likely result in poor stand establishment. The time for reclamation will depend upon the amount and quality of water that moves through the soil profile. Further information can be found in fact sheet 2226.

Signature

Company Name/Address:

APEX Environmental - Tulsa, OK

9410 East 51 Street, Suite G
Tulsa,OK 74145

Alternate billing information:

Analysis/Container/Preservative

1689 Chain of Custody Page 1 of 3

Prepared by:

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859

Report to: Terry Cochran — Email to: Tcochran@apexTulsa.com

Project Description: McCann — City/State Collected:

Phone: (918) 610-3543
FAX: (918) 610-3556

Client Project #: 450435.001 — ESC Key:

Collected by: Jason Compton — Site/Facility ID#: — P.O.#:

Collected by (signature): Jason Compton

Packed on Ice: N Y

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%

Date Results Needed:

Email? No Yes
FAX? No Yes

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Remarks/Contaminant	Sample # (lab only)
Bowring 001	C	SS		9/29/05	1310	1		392755
Bowring 002					1312			392756
Bowring 003					1315			392757
North Hickory 001					1403			392758
North Hickory 002					1406			392759
North Hickory 003					1409			392760
Mullendore 001					1462			392761
Mullendore 002					1455			392762
Mullendore 003					1457			392763

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks:

pH ____ Temp ____

Flow ____ Other ____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Jason Compton	9/29/05	1600	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature) Terri Hickey

Samples returned via: UPS FedEx Courier

Terms

Page 1 of 1

Chain of Custody Page 3 of 3

Company Name/Address:

APEX Environmental - Tulsa, OK

9410 East 51 Street, Suite G
Tulsa,OK 74145

Alternate billing information:

Prepared by:

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859

Report to: Terry Cochran

Email to: TCochran@Apex-Tulsa.com

Project Description: McCann

City/Site Collected:

Phone: (918) 610-3543
FAX: (918) 610-3556

Client Project #: 450435.001

ESC Key:

Site/Facility ID#:

P.O.#:

Collected by: Jason Compton

Collected by (signature): Jason Compton

Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day.......200%
___ Next Day.......100%
___ Two Day.......50%

Date Results Needed:
Email? __No__Yes
FAX? __No__Yes

Analysis/Container/Preservative: [illegible]

Cocode: APEXLOK (lab use only)
Template/Prelogin
Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs					Remarks/Contaminant	Sample # (lab only)
Culver #9 001	C	SS		9/29/05	1728	1	X					392808
Culver #9 002					1733							392810
~~Culver #9 003~~												
Culver Tank Battery 001					1747							392811
Culver Tank Battery 002					1755							392812
~~Culver Tank Battery 003~~												

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other________

pH ________ Temp ________

Flow ________ Other ________

Remarks:

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐	Condition: (lab use only)
Jason Compton	9/29/05	1600			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp:	Bottles Received:
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) Barbara McCay	Date: 9/30/05 Time: [illegible]	pH Checked: NCF: